

ISSN: 0740-3224

25. April 1984 ✓

Sektion Physik der
Universität München
Viererbibliothek
8000 München

*Journal of the
Optical Society
of America B*

B
Vol. 1
1984

**OPTICAL
PHYSICS**

Volume 1, Number 1

March 1984

JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B

R. W. TERHUNE, Editor

Topical Editors

M. BASS

Interactions with Matter

J. H. EBERLY

Quantum Optics

R. R. FREEMAN

Ultraviolet and X-Ray Physics

P. F. LIAO

Laser Spectroscopy and Nonlinear Optics

M. G. LITTMAN

Atomic Spectroscopy

A. R. W. MCKELLAR

Molecular Spectroscopy

A. MOORADIAN

Optical Properties of Solids

J. R. MURRAY

Laser Physics

C. V. SHANK

Ultrafast Phenomena

W. H. WEBER

Interface and Surface Physics

JOANNE B. SPREHE

Managing Editor

ELIZABETH M. BOWER

Chief Copy Editor

MARIA M. DURHAM

Assistant to the Editor

The Optical Society of America solicits papers that contribute new knowledge or understanding of any optical phenomenon, principle, or method. The material in each journal is described in a general way by the designation of its topical editors. *The Journal of the Optical Society of America B* emphasizes laser spectroscopy and modern quantum optics. *The Journal of the Optical Society of America A* emphasizes image science as well as being the general journal for basic material. Authors are urged also to consider the appropriateness of publishing their material in *Applied Optics* or the *Journal of Lightwave Technology*.

Submit manuscripts to R. W. Terhune, *Journal of The Optical Society of America, Research Laboratories, Ford Motor Company, Dearborn, Michigan 48121-2053; phone: (313) 322-6785; Arpanet: Terhune @. Ford 1*. Submission is a representation that the manuscript has not been published previously or currently submitted for publication elsewhere. The manuscript should be accompanied by a completed copy of the transfer-of-copyright form that appears frequently in this journal. This written transfer of copyright is necessary under the U.S. copyright law in order for the Optical Society to continue disseminating research results as widely as possible. Authors' institutions are expected to pay a publication charge of \$105 per printed page. Failure to honor the publication charge could delay publication.

Manuscript Preparation: Complete instructions appear in the Information for Contributors in this issue. All material, including references, figure captions, and tables, should be typed double spaced. Equations should be typed, not handwritten, wherever possible, and any unconventional notation should be explained by penciled notes in the margin. An original and three copies of the manuscript, including figures, are required, but overseas authors may send the original copy only. Figures will be reduced to one-column width (8.41 cm); lettering and numbers should be appropriately large. Low-quality computer graphics should be reworked by a draftsman. Tables should be on separate sheets, each with its own title. References and footnotes must be typed on a separate sheet and must be cited consecutively the first time they appear. References to journal articles should contain full titles.

Proof and All Correspondence concerning papers in the process of publication should be addressed to the Managing Editor, *Journal of the Optical Society of America*, 1816 Jefferson Place, N.W., Washington, D.C. 20036; phone (202) 223-8130. In all correspondence reference should be made to the title, author, and scheduled date of publication. Extensive alterations made in proof will result in assessment of an authors' alteration fee.

Copyright © 1984, Optical Society of America. Individual readers of this journal and libraries acting for them are permitted to make fair use of the material in it, such as to copy an article for use in teaching or research, without payment of fee, provided that such copies are not sold. Authorization to photocopy material for other uses under circumstances not falling within the fair-use provisions of the Copyright Act is granted by the Optical Society of America to libraries and other users registered with the Copyright Clearance Center (CCC), provided that the fee that appears on the first page of each article is paid directly to the CCC, 21 Congress Street, Salem, Mass. 01970. A complete statement of the provisions for copying, quotation, and reproduction appears in the first issue of each volume of this journal. Address any inquiries to the Executive Director, Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036.

OPTICAL SOCIETY OF AMERICA

Officers

D. R. HERRIOTT,
President

R. R. SHANNON,
President-Elect

J. M. BENNETT,
Vice President

K. M. BAIRD,
Past President

J. W. QUINN,
Executive Director

F. D. SMITH,
Treasurer

J. M. EASTMAN,
Chairperson, Technical Council

F. F. HALL,
Chairperson, Publications Committee

J. N. HOWARD, *Editor,*

Applied Optics

R. W. TERHUNE, *Editor,*

Journal of the Optical Society of America

P. L. KELLEY, *Editor,*

Optics Letters

Directors at Large*

W. B. BRIDGES (84)

F. COOKE (84)

K. A. McCARTHY (84)

R. ABRAMS (85)

J. C. DAINTY (85)

E. GARMIRE (85)

R. K. CHANG (86)

J. B. BRECKINRIDGE (86)

W. T. RHODES (86)

* Term expires at end of year indicated.

Journal of the Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036 (202) 223-8130.

Journal of the Optical Society of America B: Optical Physics, Vol. 1, No. 1, 1984. Published monthly by the Optical Society of America. Application to mail at second-class rates pending at Woodbury, N.Y., and additional mailing offices. Copyright 1984, Optical Society of America. Subscriptions, missing copies, and changes of address: American Institute of Physics, 335 East 45th Street, New York, N.Y. 10017. 1984 subscriptions: sent gratis to all nonmember subscribers to the *Journal of the Optical Society of America A* and to all OSA members. Back-number, single-issue, and foreign rates shown facing inside back cover. ISSN: 0740-3224. POSTMASTER: Send form 3579 to American Institute of Physics.

MAA4. Picosecond Measurements on Halorhodopsin of Halobacterium Halobium, H.-J. Polland, M. A. Franz, W. Zinth, and W. Kaiser, *Physik Department der Technischen Universität München, Arcisstrasse 21, D-8000 München 21, Federal Republic of Germany*, P. Hegemann and D. Oesterhelt, *Max-Planck-Institut für Biochemie, D-8033 Martinsried, Federal Republic of Germany*.

Halobacterium halobium contains at least two retinylidene protein units that show photoactivity. Bacteriorhodopsin, a light-driven proton pump, has been known for more than a decade and has been studied extensively. Halorhodopsin (or P588) was only discovered recently. Its light-driven pump acts on chlorine ions.¹ Until now, the photoreaction cycle in halorhodopsin was studied on a time scale of microseconds.² We present the first known investigations on halorhodopsin on a picosecond time scale.

Halorhodopsin has its major absorption band at 580 nm. The excitation of the sample was made with single pulses of 2.5-psec duration at $\lambda_{ex} = 540$ nm. The probing pulses were tunable over a wavelength range of $\lambda_{pr} = 570$ to 670 nm. Absorption changes were measured with a high-precision difference detection system with $\Delta I/I \approx 2 \times 10^{-4}$. Purified halorhodopsin preparations in high salt concentrations (1 M) were studied.³ A series of time-dependent transmission measurements at various probing wavelengths gave the following interesting information (Fig. MAA4-1 shows an example for $\lambda_{pr} = 646$ nm): (a) The first excited singlet state of retinal in halorhodopsin has a lifetime of 5 psec. (b) A new photoproduct is generated with the same time constant of 5 psec. (c) The photoproduct is red shifted and lives for at least 1 nsec. (d) At the low level of light of our experiments the halorhodopsin preparations show no indication of irreversible decomposition.

In analogy to bacteriorhodopsin the red shift in halorhodopsin may be connected with

the isomerization of the retinal chromophore. (12 min.)

¹ B. Schobert and J. K. Lanyi, *J. Biol. Chem.* **257**, 10306 (1982).

² H. J. Weber and R. A. Bogomolni, *Photochem. Photobiol.* **33**, 601 (1981).

³ M. Steiner and D. Oesterhelt, *The Embo J.* **1**, 1379 (1983).

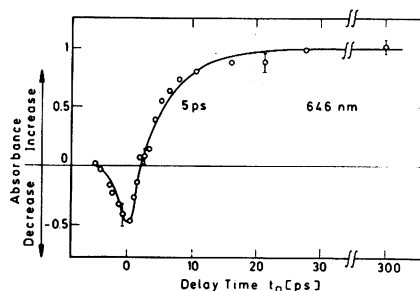


Fig. MAA4-1. Absorption change of the probe pulse as a function of time delay between exciting ($\lambda_{ex} = 540$ nm) and probing ($\lambda_{pr} = 646$ nm) pulse. The absorption decrease corresponds to the population of the first excited singlet state of halorhodopsin; the absorption increase is due to the growth of the first photoproduct.

Author Index to Volume 1, 1984

Franklin S. Harris, Jr., *Indexer*

KEY TO INDEX USE

Titles have been indexed alphabetically under authors in the Author Index, and under appropriate subject terms in the Subject Index. Cross references are included in both indexes for more thorough coverage.

Letters following the title: (E), (T), (TE), or (ET), indicate that the content of the article is experimental, theoretical, or both.

Additional classification letters are:

- (A) abstract
- (B) book review
- (L) letter
- (N) announcement, editorial, or departmental note
- (R) review article

- Abraham, E.** See Firth, W. J., 489
- Abraham, N. B.** See Arecchi, F. T., 497; Gioggia, R. S., 499
- Abram, I.** See Oudar, J. L., 500
- Ackerhalt, Jay R.**
- ; Milonni, P. W.: Chaotic dynamics in infrared multiple-photon absorption (A), 542
 - ; Milonni, P. W.: Interaction Hamiltonian of quantum optics, 116
- Acket, G. A.** See Lenstra, D., 451
- Acquista, Nicolo.** See Goldsmith, Samuel, 631
- ; Reader, Joseph: $4s^2 1S_0-4s4p 1P_1$ transitions in zinclike ions, 649
- Adams, Horst**
- ; Hall, Jeffrey L.; Curl, Robert F., Jr.; Kasper, J. V. V.; Tittel, F. K.: Sensitivity improvement of tone-burst modulated spectroscopy with a color-center laser, 710
- Afifi, M.** See Freysz, E., 433
- Agarwal, G. S.**
- Fluorescence in frequency-modulated beams: a probe of the correlation functions of atomic inversion, 865
- ; Nayak, N.: Multiphoton processes in two-level atoms in two intense pump beams, 164
 - ; Nayak, N.: Nonlinear susceptibilities of two-level systems in intense double-frequency fields (A), 515
- Agrawal, Govind P.**
- Heuristic approach to spontaneous emission factor of gain-guided lasers (L), 406
- Akhmanov, S. A.**
- ; Gladkov, S. M.; Koroteev, N. I.; Zadkov, V. N.; Shumay, I. L.; Marowsky, G.: Coherent anti-Stokes Raman spectroscopy thermometry of multiatomic gases: SF₆ (A), 486
- Alattar, H. A.** See MacKenzie, H. A., 500
- Albano, A. M.** See Gioggia, R. S., 499
- Allman, S. L.** See Chen, Chung H., 554
- Al-Saidi, I. A.** See Harrison, R. G., 488
- Altshuler, G. B.**
- ; Ermolaev, V. S.; Krilov, K. I.; Manenkov, A. A.; Prokhorov, A. M.: Self-transparency effects in nonlinear light-scattering inhomogeneous media and their possible use in lasers (A), 538
- Aminoff, C. G.**
- ; Hall, John L.: Stable two-mode operation of a continuous-wave dye laser using a Michelson mode selector (A), 438
- Andreoni, A.**
- ; Cubeddu, R.: Photophysical properties of Photofrin II in different solvents (A), 559
 - ; Cubeddu, R.; Svelto, O.: Two-step laser photobiology: application for cancer treatment (A), 556
- Ankerst, J.**
- ; Montán, S.; Svanberg, K.; Svanberg, Sune: Contrast enhancement in tumor localization using hematoporphyrin-derivative laser-induced fluorescence (A), 558
- Ansbacher, W.** See Pinnington, E. H., 30
- Antonetti, A.** See Migus, A., 454
- Arecchi, F. T.**
- ; Lippi, G.; Tredicce, J. R.; Abraham, N. B.: Spontaneous oscillations, generalized multistability and intermittency route to chaos in a bidirectional CO₂ ring laser (A), 497
- Arimondo, E.**
- ; Di Vito, M. G.; Ernst, K.; Inguscio, M.: Direct evidence of heating and cooling in the optogalvanic-effect energy balance (A), 514
- Arjavalingam, G.** See Glowina, J. H., 545
- Asada, Masahiro**
- ; Suematsu, Yasuharu: Gain and gain suppression in semiconductor lasers (A), 450
- Atencio, J. H.** See Hyer, R. C., 429
- Atkinson, R.** See Cardamone, M. J., 779
- Attili, M.** See Thomas, John E., 482
- Aussenegg, F. R.**
- ; Draxler, S.; Leitner, A.; Lippitsch, M. E.; Riegler, M.: Picosecond investigations on the fluorescence properties of adsorbed dye molecules (A), 456
- Avizonis, Petras V.** See Elçi, A., 432
- Aymar, M.**
- Multichannel-quantum-defect theory wave functions of Ba tested or improved by laser measurements, 239
- Azcárate, Mafía Laura**
- Infrared multiple-photon dissociation of chloroform-d (A), 512
- Babbitt, W. R.** See Carlson, Nils W., 506
- Baboneau, D.** See Di Bona, G., 471
- Bai, Y. S.** See Carlson, Nils W., 506
- Ballagh, R. J.** See Satchell, J. S., 491
- Banash, M.**
- ; Loiza, F.; Spano, F.; Warren, W. S.: Phase coherent laser multiple-pulse spectroscopy (A), 545
- Barakat, M. M.** See VanKleeef, Th. A. M., 795
- Barbee, Troy W., Jr.**
- ; Warburton, William K.; Underwood, James H.: Determination of the x-ray anomalous dispersion of titanium made with a titanium-carbon layered synthetic microstructure, 691
- Bar-Joseph, Israel.** See Silberberg, Yaron, 662
- ; Silberberg, Yaron: Self-oscillations of counterpropagating waves in a two-level medium (A), 498
- Barnouin, O.** See Richardson, M. C., 469
- Bazin, C.** See Ortéga, J. M., 496
- Beach, R.**
- ; Brody, B.; Hartmann, S. R.: Angled-beam photon echoes, 189
- Becker, W.**
- ; McIver, J. K.: Classical versus quantum noise in the start-up of free-electron lasers (A), 523
- Beigang, R.**
- ; Timmermann, A.: Thermionic ring diode for high-resolution spectroscopy for Rydberg states (A), 519
- Bellano, M. V.**
- ; Bonifacio, R.; Casagrande, F.: Instability and quantum initiation in the free-electron laser (A), 523
- Bergher, M.** See Ortéga, J. M., 496
- Bernabeu, E.**
- ; Tornos, J.: Influence of optical factors on the relaxation signal of an optically pumped vapor, 586
- Berns, M. W.**
- Lasers in cell biology and genetics (A), 560
- Berry, M. J.** See Kunz, T. D., 541
- Bielinski, Joseph W.** See Freed, Charles, 544
- Bieniewski, Thomas M.**
- Oscillator strengths for neutral atomic uranium, 300
- Bigio, Irving J.** See Slatkine, Michael, 509
- Billardon, M.** See Ortéga, J. M., 496
- Bjorklund, Gary C.** See Romagnoli, Marco, 341, 571; Whittaker, E. A., 494
- Bloch, Daniel.** See Le Boiteux, S., 501
- Blgembergen, Nicolaas.** See Mazur, E., 538
- ; Kurz, H.: Physics of laser annealing of semiconductors (A), 446
- Bocher, J. L.** See Di Bona, G., 471
- Bochove, Erik J.**
- Eigenmodes of Kerr-type phase-conjugate mirrors, 756
- Bodner, S. E.** See Obenschain, S. P., 470
- Bokor, Jeffrey**
- ; Haight, R.; Storz, R. H.; Stark, J.; Freeman, Richard R.; Bucksbaum, P. H.: Photoemission studies of surfaces using picosecond pulses of coherent extreme-ultraviolet radiation (A), 529
- Boni, R.** See Seka, W., 480
- Bonifacio, R.** See Bellano, M. V., 523
- Bonin, Keith D.**
- ; McIlrath, Thomas J.: Two-photon electric-dipole selection rules, 52
- Bonomo, F. S.** See Giver, Lawrence P. M., 715
- Boswell, B.** See Tanaka, K., 480
- Bottiroli, G.**
- ; Docchio, F.; Freitas, I.; Sacchi, C. A.: Mechanisms of the hematoporphyrin-derivative-induced photodamage of neoplastic cells: fluorescence studies (A), 556
- Bowden, Charles M.** See Haus, Joseph W., 742; Sung, C. C., 476, 395
- Boyd, Robert W.** See Bruklicchio, Thomas J., 354; Malcuit, Michelle S., 73
- ; Gauthier, Daniel J.; Krasinski, Jerzy; Malcuit, Michelle S.: Continuously tunable sum-frequency generation involving sodium Rydberg states (A), 507
- Boyer, K.**
- ; Egger, H.; Luk, T. S.; Pummer, H.; Rhodes, Charles K.: Interaction of atomic and molecular systems with high-intensity ultraviolet radiation, 3
- Brau, C. A.** See Newnam, Brian E., 505
- Brewer, Richard G.** See DeVoe, Ralph G., 527; Mitsunaga, M., 502
- Brody, B.** See Beach, R., 189

- Brukilacchio, Thomas J.**
—; Skeldon, Mark D.; Boyd, Robert W.: Generation-recombination noise in intrinsic photoconductive detectors, 354
- Brunner, W.**
—; Fischer, R.; Paul, H.: Chaos and order in the spectral behavior of multimode lasers (A), 487
- Bryan, D. A.**
—; Gerson, Robert; Tomaschke, H. E.: High-photoconductivity lithium niobate (A), 442
- Bucksbaum, P. H.** See Bokor, Jeffrey, 529
- Buhr, E.** See Mlynek, J., 492
- Burak, Itamar.** See Mazur, E., 538
- Burdge, Geoffrey.** See Strobel, Scott, 437
- Burkey, Ronald S.**
—; Cantrell, Cyrus D.: Discretization in the quasi-continuum (A), 539, 169
- Burkhalter, P. G.**
—; Charatis, G.; Rockett, Paul D.; Newman, Daniel: X-ray spectra of B- and Be-like chromium in the 13–15-Å region, 155
- Burnham, Robert D.**
—; Paoli, T. L.; Streifer, William; Holonyak, N., Jr.; Scifres, Donald R.: GaAlAs/GaAs quantum-well lasers by metalorganic chemical-vapor deposition (A), 542
- Burns, Alan R.**
—; Kelber, Jeffery A.; Rice, James K.: Multiphoton resonance ionization of neutral hydrogen atoms in electron-stimulated desorption (A), 472
- Byer, Robert L.** See Zhou, B. K., 438
- Campbell, E. M.** See Kauffman, R. L., 481
Laser-plasma interaction experiments at the 0.53- μm Novette facility (A), 480
- Campillo, Anthony J.**
—; Goldberg, Lawrence S.; Griffin, R. D.; Justus, B. L.; Schoen, P. E.: Simultaneous multikilobar compressional shock-wave generation and probing using short-pulse lasers (A), 444
- Cantrell, Cyrus D.** See Burkey, Ronald S., 539, 169
- Cardamone, M. J.**
—; Rhodes, W.; Atkinson, R.; Yeasted, M.: Brillouin-scattering determination of vibrational relaxation in dichloromethane, 779
- Carlson, Nils W.**
Introduction to Nonlinear Laser Spectroscopy. By Marc D. Levenson (B), 409
—; Babbitt, W. R.; Bai, Y. S.; Mossberg, Thomas W.: Shape locking of photon echoes (A), 506
- Carlsten, J. L.** See Wenzel, Robert G., 445
- Carter, Gary M.**
—; Chen, Y. J.; Tripathy, S. K.: Optical nonlinear coupling and applications to thin-film and bulk nonlinear spectroscopy (A), 458
- Carusotto, S.**
—; Iacopini, E.; Polacco, E.; Scuri, F.; Stefanini, G.; Zavattini, E.: Measurement of the magnetic birefringence of noble gases, 635
- Casagrande, F.** See Bellano, M. V., 523
- Cassidy, Daniel T.**
Analytic model of homogeneously broadened injection lasers: comparison of theory and experiment (A), 462
- Caves, Carlton M.** See Schumaker, Bonny L., 524
- Chang, Cheng-chuan.** See Lu, Ren-xiang, 481
- Charatis, G.** See Burkhalter, P. G., 155
- Chase, L. L.**
—; Claude, M. L.; Hulin, D.; Mysyrowicz, A.: Optical phase conjugation near resonance with biexciton two-photon absorption in CuCl (A), 533
- Chebotaev, V. P.**
Resonant magnetic rotation of polarization directions (A), 546
- Chemla, D. S.**
Optical transition in quantum wells: valence band mixing, confined and extended excitons (A), 535
- Chen, C. J.**
—; Gilgen, H. H.; Osgood, R. M., Jr.: Enhanced growth of submicrometer metal gratings (A), 474
- Chen, C. K.**
Two-cavity optical klystron (A), 524
- Chen, Chuang-tian**
—; Wu, Bai-chang; You, Gui-ming; Jiang, Ai-dong; Huang, Yi-chuan: High-efficiency and wide-band single-harmonic-generation properties of the new crystal β -BaB₂O₄ (A), 434
- Chen, Chung H.**
—; Kramer, Steven D.; Allman, S. L.; Hurst, G. S.: Isotope-selective counting of krypton atoms using resonance ionization spectroscopy (A), 554
- Chen, Mau Hsiung.** See Crasemann, Bernd, 224
- Chen, Y. J.** See Carter, Gary M., 458
- Chew, Herman W.**
—; Wang, Dau-Sing; Kerker, Milton: Surface enhancement of coherent anti-Stokes Raman scattering by colloidal spheres, 56
- Chichester, R. J.** See Shaw, E. D., 497
- Childs, W. J.** See Pfeufer, V., 34
—; Crosswhite, Henry M.; Goodman, L. S.; Pfeufer, V.: Hyperfine structure of $4f^N 6s^2$ configurations in ¹⁵⁹Tb, ^{161,163}Dy, and ¹⁶⁹Tm, 22
- Chin, S. L.**
—; He, K. X.; Yergeau, F.: First reported observation of multiply charged ions of alkaline atoms by multiphoton ionization (A), 505
- Cho, Yoshio**
—; Umeda, Tokuo: Chaos in laser oscillations with delayed feedback: numerical analysis and observation using semiconductor lasers (A), 497
- Chraplyvy, A. R.**
—; Stone, Julian: Synchronously pumped D₂ gas-in-glass fiber Raman laser operating at 1.56 μm (A), 430
- Christensen, J.** See Worden, Earl F., 314
- Chu, Guiyin**
—; Zhu, Huanan; Zhang, Zhiguo; Fu, Panming; Ye, Pexuan: Degenerate four-wave mixing in dye-dissolving liquid crystal (A), 526
- Chu, Sten**
—; Mills, Allen P., Jr.; Hall, John L.: Precision positronium spectroscopy (A), 504
- Chuang, T. J.** See Hussla, Ingo, 473
- Chyba, T. H.** See Goggia, R. S., 499
- Cirković, Lj.** See Popović, M. V., 515
- Clark, Charles W.**
Discrete $4d$ photoabsorption spectrum of Ba²⁺, 626
- Claude, M. L.** See Chase, L. L., 533
- Cleis, Richard A.**
—; Roh, Won B.; Goss, Larry P.: Raman linewidths of hydrogen fluoride determined by using low-resolution coherent anti-Stokes Raman spectroscopy, 774
- Collett, M. J.** See Gardiner, C. W., 548
- Collins, C. B.** See DePaola, B. D., 812
—; DePaola, B. D.: Tunable radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels (A), 529
- Colson, W. B.**
Tutorial on free-electron lasers (A), 523
- Comaskey, Brian.** See Worden, Earl F., 314
- Conway, John G.** See Van Deurzen, C. H. H., 45; Worden, Earl F., 314
—; Worden, Earl F.: Isotope shift of uranium in the infrared region between 1817 and 5598 cm^{-1} , 788
- Corkum, Paul B.**
Optical pulse compression in the infrared (A), 451
- Corn, Robert M.**
—; Romagnoli, Marco; Levenson, Marc D.; Philpott, Michael R.: Second-harmonic generation from thin-film silver electrodes via surface plasmons (A), 446
- Cozzani, I.** See Jori, G., 555
- Craig, B. B.** See Faust, W. L., 530
- Craig, D.** See Miller, A., 475
- Crasemann, Bernd**
—; Chen, Mau Hsiung; Mark, Hans: Atomic inner-shell transitions, 224
- Craxton, R. S.** See Richardson, M. C., 469; Seka, W., 480; Tanaka, K., 480
- Crichton, James H.** See Marston, Philip L., 528
- Cronin-Golomb, Mark.** See Kwong, S., 532
- Crossley, Richard**
On the ¹P^o levels of Li⁺, 266
- Crosswhite, Hannah.** See Crosswhite, Henry M., 246; Judd, B. R., 255; Nielsen, Ulrik, 284
- Crosswhite, Henry M.** See Childs, W. J., 22
—; Crosswhite, Hannah: Parametric model for f -shell configurations. I. The effective-operator Hamiltonian, 246
- Crowell, J. E.** See Tom, H. W. K., 446
- Csonka, Paul L.** See Tatchyn, Roman, 806
- Cubeddu, R.** See Andreoni, A., 556, 559
- Curl, Robert F., Jr.** See Adams, Horst, 710
- Dagenais, M.**
—; Sharfin, W. F.; Winful, Herbert G.: Low-power optical bistability in cadmium sulfide platelets (A), 476
- Dalibard, J.** See Prodan, J. V., 504
- Damzen, M. J.**
—; Hutchinson, M. H. R.: Applications of the Brillouin mirror for the control of high-power lasers (A), 534
- Dandridge, Anthony**
—; Miles, R. O.: Polarization noise properties of GaAlAs lasers (A), 462
- Deaton, Terence F.** See O'Connell, R. M., 853
- Dehmer, J. L.**
—; Dehmer, P. M.; Pratt, S. T.: Photoelectron studies of excited molecular states. H₂C ¹I_u and N₂ O₃ ¹I_u (A), 495
- Dehmer, P. M.** See Dehmer, J. L., 495
- Delettrez, J.** See Richardson, M. C., 469; Seka, W., 480
- DeMaria, Anthony J.**
Lasers in modern industry (A), 464
- De Martini, Francesco.** See Di Lazzaro, P., 447
- Demers, Y.** See Pianarosa, P., 704
- Deng, Z.**
Line narrowing and photoelectron trapping in multiphoton ionization spectroscopy, 874
—; Eberly, Joseph H.: Double-resonance effects in strong-field autoionization, 102
- Denne, B.**
—; Hinnov, E.: Spectrometer-sensitivity

- calibration in the extreme ultraviolet by means of branching ratios of magnetic-dipole lines, 699
- ; Hinnov, E.; Suckewer, S.; Timberlake, J.: On the ground configuration of the phosphorus sequence from copper to molybdenum, 296
- Densberger, J.** See Worden, Earl F., 314
- DePaola, B. D.** See Collins, C. B., 529
- ; Collins, C. B.: Tunability of radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels, 812
- Derstine, M. W.**
- ; Gibbs, Hyatt M.; Hopf, Frederic A.; Sanders, L. D.: Distinguishing chaos from noise in an optically bistable system (A), 464
- Deserno, R.** See Lange, W., 468
- De Silvestri, S.**
- ; Laporta, P.; Svelto, O.: Effects of cavity dispersion in femtosecond mode-locked dye lasers (A), 436
- DeVoe, Ralph G.** See Mitsunaga, M., 502
- ; Schenzle, A.; Mitsunaga, M.; Brewer, Richard G.: Tests of the optical Bloch equations for solids (A), 527
- Di Bona, G.**
- ; Baboneau, D.; Bocher, J. L.; Fortin, X.; Valentin, S.: Simple model for radiation transport in laser targets linking local thermodynamical equilibrium and coronal ionizations (A), 471
- Diels, Jean-Claude.** See McMichael, Ian C., 435
- ; Dietel, W.; Doppel, E.; Fontaine, Joel J.; McMichael, Ian C.; Rudolph, V.; Simoni, F.; Wilhelmi, B.: Control of profile and chirp of femtosecond light pulses by propagating them through resonant and nonresonant optical media (A), 435
- Dietel, W.** See Diels, Jean-Claude, 435
- Dietrich, R.** See Jocham, D., 556
- Di Lazzaro, P.**
- ; Mataloni, P.; De Martini, Francesco: Study of the structural arrangement of xanthene molecular adsorbates at interfaces by optical second-harmonic generation (A), 447
- Dingle, R.**
- Then and now—history and recent developments in superlattice quantum-well structures (A), 535
- Dittmore, C. H.** See Henke, B. L., 828
- Di Vito, M. G.** See Arimondo, E., 514
- Dixon, R. H.**
- ; Elton, R. C.: Spectroscopy of x-ray lasers, 232
- Dlbal, M. L.**
- ; Tankersley, L. L.; Reintjes, J. F.: High-energy vacuum-ultraviolet frequency conversion (A), 522
- Docchio, F.** See Bottiroli, G., 556
- Doiron, Daniel R.** See Gomer, Charles J., 557
- ; Gomer, Charles J.; Fountain, Stanley W.; Razum, Nicholas J.; Murphree, A. Linn: Light delivery systems and dosimetry in photodynamic therapy (A), 557
- Dong, Gen-fa.** See Li, Yu-fen, 511
- Doppel, E.** See Diels, Jean-Claude, 435
- Dorsel, A.**
- ; McCullen, J. D.; Meystre, Pierre; Walther, Herbert; Wright, E.: Light-pressure stabilization of optical resonators (A), 441
- Dougherty, Thomas J.**
- Photodynamic therapy for treatment of cancer (A), 555
- Drake, R. P.** See Kauffman, R. L., 481
- Draxler, S.** See Aussenegg, F. R., 456
- Drühl, K. J.** See Wenzel, Robert G., 445
- Dubard, J.** See Oudar, J. L., 500
- Ducasse, A.** See Freysz, E., 433
- Ducloy, Martial.** See Le Boiteux, S., 501
- Dutta, N. K.**
- ; Olsson, N. A.; Liou, K.-Y.: Dynamic linewidth of amplitude-modulated single-longitudinal-mode InGaAsP semiconductor lasers (A), 459
- Duval, A. B.** See Orr, Brian J., 503
- Dvorkis, P.** See Gover, A., 723
- Eberly, Joseph H.** See Deng, Z., 102; Hioe, F. T., 546; Sanchez-Mondragon, J. J., 518; Wódkiewicz, K., 506, 398, 759; Yamanoi, Montoomi, 751
- ; Yoo, H.-I.; Meystre, Pierre; Narozhny, N. B.; Sanchez-Mondragon, J. J.: Spontaneous quantum collapse and revival (A), 520
- Ederer, D. L.** See Madden, Robert P., 521
- Edighoffer, John A.**
- ; Neil, George R.; Fornaca, Steve; Smith, Todd; Hess, Carl; Swettman, Alan: Results of the TRW/Stanford tapered-wiggler oscillator experiments (A), 497
- Egger, H.** See Boyer, K., 3; Jara, H., 551
- Egdon, William W.** See Gao, J. Y., 606
- Eilenberger, D. J.** See Smith, P. W., 452
- Elçi, A.**
- ; Scully, Marlan O.; Zubairy, M. Suhail; Avizonis, Petras V.: New laser concept: magnetic-surface-induced spin-flip transitions (A), 432
- Elisha, U.** See Gover, A., 723
- Elleaume, P.** See Ortéga, J. M., 496
- Elton, R. C.** See Dixon, R. H., 232
- Engleman, Rolf, Jr.** See Palmer, Byron A., 609
- ; Palmer, Byron A.: Precision isotope shifts for the heavy elements. III. Singly ionized thorium (Th II), 782
- Ermolaev, V. S.** See Altschuler, G. B., 538
- Ernst, K.** See Arimondo, E., 514
- Ernst, W. E.**
- ; Kindt, S.; Schröder, J. O.; Törring, T.: Laser-microwave double-resonance experiments for high-resolution spectroscopy of radicals (A), 495
- Erskine, D. J.**
- ; Taylor, A. J.; Tang, C. L.: Femtosecond studies of intraband relaxation in GaAs and related compounds and structures (A), 427
- Estabrook, K. G.** See Kauffman, R. L., 481
- Etchepare, J.** See Migus, A., 454
- Evenson, Kenneth M.**
- ; Sears, Trevor J.; McKellar, A. R. W.: Far-infrared laser magnetic resonance of vibrationally excited CD₂, 15
- Ezekiel, Shaoul.** See Hemmer, P. R., 528; Sanders, G. A., 528
- Fauchet, A. M.** See Piestrup, M. A., 531
- Fauchet, P. M.**
- ; Siegman, A. E.: Laser-induced surface ripples: recent developments (A), 455
- Faust, W. L.**
- ; Craig, B. B.: Nonlinear ultraviolet excitation of nitriles to metastable superexcited states XCN**, indications for collisionally induced fragmentation of XCN** (A), 530
- Fawcett, B. C.**
- Classification in the early 1980's of the spectra of highly ionized atoms, 195
- Feld, M. S.** See Thomas, John E., 482
- Fellows, C. E.** See Tavares, A. Dias, Jr., 513
- Feynman, Richard P.**
- Quantum-mechanical computers (A), 464
- Ficek, Z.**
- ; Tanaš, R.; Kielich, S.: Squeezed states in the transient regime of resonance fluorescence, 882
- ; Tanaš, R.; Kielich, S.: Squeezed states in transient regime of resonance fluorescence (A), 517
- Figger, H.**
- ; Fukuda, Y.; Ketterle, W.; Schrepp, W.; Watson, J. K. G.; Walther, Herbert: Spectroscopy of the Rydberg molecules H₃, D₃, D₂H, and H₂D (A), 493
- Firth, W. J.** See Harrison, R. G., 488; Pidgeon, C. R., 505
- ; Abraham, E.; Wright, E. M.: Physical interpretation of the route to chaos in nonlinear resonators (A), 489
- Fischer, R.** See Brunner, W., 487
- Flusberg, Allen.** See Rokni, M., 491
- Flytzanis, C.** See Geirnaert, M. L., 442
- Fontaine, Joel J.** See Diels, Jean-Claude, 435
- Forber, R. A.** See Thomas, John E., 482
- Fork, R. L.** See Gordon, J. P., 437
- Fornaca, Steve.** See Edighoffer, John A., 497
- Fortin, X.** See Di Bona, G., 471
- Fountain, Stanley W.** See Doiron, Daniel R., 557; Gomer, Charles J., 557
- Fox, A. M.** See Miller, A., 428
- Franz, M. A.** See Poland, H.-J., 429
- Fraser, J. S.** See Newnam, Brian E., 505
- Freed, Charles**
- ; Bielinski, Joseph W.; Lo, Wayne; Partin, Dale L.: Output characteristics of lead telluride quantum-well diode lasers (A), 544
- Freeman, Richard R.** See Bokor, Jeffrey, 529
- Freitas, I.** See Bottiroli, G., 556
- Freysz, E.**
- ; Afifi, M.; Ducasse, A.; Pouligny, B.; Lalanne, J. R.: Critical microemulsions as optically nonlinear media (A), 433
- Fu, Panming.** See Chu, Guiyin, 526
- Fujimoto, James G.**
- ; Weiner, A. M.; Ippen, Erich P.: Compression and parametric scattering with femtosecond pulses (A), 435
- Fujiwara, F. G.** See Henke, B. L., 828
- Fukuda, Y.** See Figger, H., 493
- Gagné, Jean-Marie.** See Pianarosa, P., 704
- Gale, G. M.** See Geirnaert, M. L., 442
- Gao, J. Y.**
- ; Eidson, William W.; Squicciarini, M. F., Jr.; Narducci, Lorenzo, M.: Scheme for investigation of two-photon emission in sodium, 606
- Gao, Ping.** See Zhang, Heyi, 457
- Gao, Q. F.** See Le Boiteux, S., 501
- Gardiner, C. W.**
- ; Collett, M. J.: Master equation and quantum Langevin theory of input, output, and internal modes of linear and nonlinear quantum amplifiers (A), 548
- Gardner, J. H.** See Obenschain, S. P., 470
- Garito, A. F.** See Wong, King-Young, 434
- Garmire, Elsa M.** See Goldstone, J. A., 466; Poole, C. D., 475
- Garside, Brian K.** See Sinclair, R. L., 439
- Garstang, Roy H.**
- Hyperfine structure and the broadening of sunspot spectral lines, 311
- Gauthier, Daniel J.** See Boyd, Robert W., 507
- Geirnaert, M. L.**
- ; Gale, G. M.; Flytzanis, C.: Time-resolved spectroscopy of vibrational overtones and two-phonon states (A), 442

- George, Simon**
—; Munsee, J. H.; Verges, J.: Hyperfine structure in the $6p^3\ ^4S^{\circ}_{3/4}-6p^3\ ^2D^{\circ}_{5/2}$, 647.5-nm forbidden transition in Bi I (L), 320
- Gerson, Robert**. See Bryan, D. A., 442
- Ghosh, A. P.** See Thomas, John E., 482
- Gibbs, Hyatt M.** See Derstine, M. W., 464; Le Berre, M., 591; Tai, K., 490
- Gil, Tomasz**. See Heldt, Jozef, 48
- Gilgen, H. H.** See Chen, C. J., 474
- Gioggia, R. S.**
—; Albano, A. M.; Searle, C. M.; Chyba, T. H.; Abraham, N. B.: Dimensionality of dynamical chaos in an unstable single-mode laser (A), 499
- Girouard, Fernand E.**
—; Truong, Vo-Van: Optical constants of thick Ti and Mn films in the spectral region from 6 to 20 eV, 76
- Giver, Lawrence P. M.**
—; Valero, Francisco P. J.; Goorvitch, David; Bonomo, F. S.: Nitric-acid band intensities and band-model parameters from 610 to 1760 cm^{-1} , 715
- Gladkov, S. M.** See Akhmanov, S. A., 486
- Glownia, J. H.**
—; Arjavalingam, G.; Sorokin, P. P.: Study of DABCO as a possible two-photon laser—population dynamics and absorption spectrum of the excited \bar{A} state (A), 545
- Göbel, E. O.** See Kuhl, J., 452
- Goldberg, Lawrence S.** See Campillo, Anthony J., 444
- Goldman, L. M.** See Seka, W., 480; Tanaka, K., 480
- Goldsmith, Samuel**
—; Reader, Joseph; Acquista, Nicolo: Spectrum and energy levels of eight-times ionized rubidium (Rb IX), 631
- Goldstein, John C.** See Newnam, Brian E., 505
- Goldstone, J. A.**
—; Garmire, Elsa M.: Macroscopic manifestations of microscopic optical bistability (A), 466
- Gomer, Charles J.** See Doiron, Daniel R., 557
—; Murphree, A. Linn; Doiron, Daniel R.; Razum, Nicholas J.; Fountain, Stanley W.: Treatment of intraocular tumors with hematoporphyrin-derivative photoradiation therapy (A), 557
- Goodman, Joseph W.**
Optical computing: how far can light waves penetrate computer technology? (A), 464
- Goodman, L. S.** See Childs, W. J., 22; Pfeufer, V., 34
- Goorvitch, David**. See Giver, Lawrence P. M., 715
- Gordon, J. P.**
—; Fork, R. L.; Martinez, O. E.: Negative dispersion from prisms (A), 437
- Gosnell, T. R.**
—; Tkach, R. W.; Sievers, A. J.: Matrix-isolated CN^- : a molecular-defect vibrational laser (A), 430
- Goss, Larry P.** See Cleis, Richard A., 774
- Gossard, A. C.** See Miller, D. A. B., 477
- Gover, A.**
—; Dvorkis, P.; Elisha, U.: Angular radiation pattern of Smith-Purcell radiation, 723
- Goy, P.** See Haroche, S., 518
- Graener, H.**
—; Laubereau, A.; Nibler, J. W.: Fourier-transform Raman spectroscopy of supersonic expansions (A), 503
- Greene, Benjamin I.**
—; Wolfe, R.: Femtosecond relaxation dynamics in magnetic garnets (A), 427
- Griffin, R. D.** See Campillo, Anthony J., 444
- Grillon, G.** See Migus, A., 454
- Gromov, D. A.**
—; Kyumaev, K. M.; Manenkov, A. A.; Maslyukov, A. P.; Matyushin, G. A.; Nechitailo, V. S.; Prokhorov, A. M.: Efficient plastic-host dye lasers (A), 431
- Gross, M.** See Haroche, S., 518
- Grossman, M.**
—; Maya, J.: Photochemical enrichment of ^{196}Hg (A), 553
- Grover, L. K.**
—; Pantell, R. H.: Simplified analysis of spontaneous and stimulated emission for various free-electron laser configurations (A), 524
- Grun, J.** See Obenschain, S. P., 470
- Grynberg, G.**
—; Pinard, M.; Verkerk, P.: Saturation in degenerate four-wave mixing (A), 501
- Gustafson, T. K.** See Wummer, Joel, 508
- Haake, F.**
—; Reibold, R.; Mattar, Farres P.: Quantum fluctuations in two-color superfluorescence from three-level systems (A), 547
- Hagen, W. F.**
High Power Iodine Laser. By G. Brederlow, E. Fill, and K. J. Witte (B), 324
- Häger, J.**
—; Vach, H.; Walther, Herbert: State-selective investigation of molecule-surface interaction by laser diagnostics (A), 472
- Haight, R.** See Bokor, Jeffrey, 529
- Haines, R.** See Orr, Brian J., 503
- Hall, Jeffrey L.** See Adams, Horst, 710
- Hall, John L.** See Aminoff, C. G., 438; Chu, Sten, 504
- Hammel, S.** See Moloney, Jerry V., 499
- Hans, J. W.** See Sung, C. C., 476
- Haroche, S.**
—; Goy, P.; Gross, M.; Raimond, J. M.: Rydberg atoms and radiation in cavities—quantum and collective effects (A), 518
- Harrison, J.**
—; Mooradian, A.: Temperature dependence of quantum-fluctuation linewidth broadening in (GaAl)As diode lasers (A), 459
- Harrison, R. G.**
—; Firth, W. J.; Al-Saidi, I. A.: Observation of period-doubling to chaos in all-optical Fabry-Perot resonators (A), 488
- Hartmann, H.-J.**
—; Laubereau, A.: Small-area pulse propagation on the picosecond time scale (A), 538
- Hartmann, S. R.** See Beach, R., 189
- Hauchecorne, Gérard**. See Mayer, Guy, 516
- Haus, H. A.**
—; Islam, M. N.: Theory of the soliton laser (A), 445
- Haus, Joseph W.**
—; Bowden, Charles M.; Sung, C. C.: Steady-state and pulse behavior of light transmitted through dispersive nonlinear media in a ring cavity, 742
—; Lewenstein, Maciej; Rzążewski, Kazimierz: Finite interaction times and laser-bandwidth effects on the photoemission from an autoionizing atom, 641
- He, Guo-zhong**
—; Wang, Xiu-yan; Shen, Guan-lin; Ren, Ji-lun; Lou, Nan-quan: Study of calcium monohalide-rare-gas collisional energy transfer processes by laser-excited-state-resolved fluorescence spectroscopy (A), 511
- He, K. X.** See Chin, S. L., 505
- He, Xuehua**. See Zhang, Heyi, 457
- Heber, J.** See Szabo, A. G., 550
- Hegemann, P.** See Polland, H.-J., 429
- Heiman, D.** See Seiler, D. G., 548
- Heinz, T. F.** See Tom, H. W. K., 446
—; Tom, H. W. K.; Zhu, X. D.; Shen, Y. R.: Second-harmonic generation in bulk centrosymmetric media (A), 432
- Heldt, Jozef**
—; Gil, Tomasz; Zachara, Stanislaw; Hults, Malcom: Hyperfine structure intensity measurements as a tool for quadrupole radial integral determination, 48
- Hellwarth, Robert W.**
Use of phase conjugation for physical measurement (A), 532
- Hemmer, P. R.**
—; Ezekiel, Shaoul; Leiby, C. C., Jr.: Performance of a microwave clock based on a laser-induced stimulated Raman interaction (A), 528
- Henke, B. L.**
—; Fujiwara, F. G.; Tester, M. A.; Dittmore, C. H.; Palmer, M. A.: Low-energy x-ray response of photographic films. II. Experimental characterization, 828
—; Kwok, S. L.; Uejo, J. Y.; Yamada, H. T.; Young, G. C.: Low-energy x-ray response of photographic films. I. Mathematical models, 818
- Herbst, M. J.** See Obenschain, S. P., 470
- Hermann, J. A.**
Beam propagation and optical power limiting with nonlinear media, 729
- Herring, G. C.** See She, C. Y., 546
- Hertel, I. V.** See Müller, W., 508
- Hess, Carl**. See Edighoffer, John A., 497
- Hess, P.**
—; Schäfer, B.: Resonant heating and wavelength-dependent infrared-laser desorption from condensed layers (A), 474
- Hillman, Lloyd W.** See Malcuit, Michelle S., 73
—; Yuan, Jia-Yong; Koch, Karl; Krasiński, Jerzy; Stroud, Carlos R., Jr.: Behavior of homogeneously broadened lasers operating far above threshold (A), 440
- Hinnov, E.** See Denne, B., 296, 699
- Hioe, F. T.**
—; Eberly, Joseph H.: Multiphoton excitation by adiabatic following (A), 546
- Holonyak, N., Jr.** See Burnham, Robert D., 542
- Hopf, Frederic A.** See Derstine, M. W., 464
- Hou, J. Y.** See Khoo, I. C., 477
- Huang, Yi-chuan**. See Chen, Chuang-tian, 434
- Hulin, D.** See Chase, L. L., 533
- Hults, Malcom**. See Heldt, Jozef, 48
- Hunsperger, R. G.** See Kopeika, N. S., 121
- Hunziker, H. E.** See Whittaker, E. A., 494
- Hurst, G. S.** See Chen, Chung H., 554
- Hurst, W. S.** See Rosasco, G. J., 545
- Hussla, Ingo**
—; Chuang, T. J.: Infrared-laser spectroscopy of ammonia-copper adsorbates by infrared-laser-induced photodesorption under ultrahigh vacuum (A), 473
- Huston, A. L.**
—; Moerner, W. E.: Detection of persistent spectral holes using ultrasonic modulation, 349
- Hutchinson, M. H. R.** See Damzen, M. J., 534
—; Ness, K. M. M.: Laser-induced autoionization studies in xenon (A), 519

- Hyer, R. C.**
—; Wheeler, G. L.; Atencio, J. H.: Protein-protein intermolecular singlet energy transfer: the use of picosecond spectroscopy for the analysis of light-induced protein motions of retinal rod cells (A), 429
- Iacopini, E.** See Carusotto, S., 635
- Ibaraki, A.**
—; Ishikawa, S.; Ohkouchi, S.; Iga, Kenichi: GaAlAs/GaAs surface-emitting injection laser (A), 463
- Iga, Kenichi.** See Ibaraki, A., 463
- Ih, Charles S.** See Kopeika, N. S., 121
- Ikeda, K.**
Optical chaos due to a competition between multiple oscillations (A), 487
- Ikegami, T.**
Single-longitudinal-mode stabilization of semiconductor lasers (A), 450
- Inaba, Humio.** See Okumura, Kenichiro, 465
Optically bistable operation of laser by output-feedback pumping and loss-modulation schemes with first-order phase-transition analogies (A), 467
- Inguscio, M.** See Arimondo, E., 514
- Ippen, Erich P.** See Fujimoto, James G., 435
- Isenor, N. R.** See Orr, Brian J., 503
- Ishida, Yuzo.** See Yajima, Tatsuo, 526
- Ishikawa, S.** See Ibaraki, A., 463
- Islam, M. N.** See Haus, H. A., 445
- Ito, Hiromasa.** See Okumura, Kenichiro, 465
- Jain, R. K.** See Stolen, Roger H., 652
- Janevski, Z.** See Popović, M. V., 515
- Jara, H.**
—; Pummer, H.; Egger, H.; Rhodes, Charles K.: Ultraviolet excitation of cryogenic rare-gas-fluorine solutions (A), 551
- Jaroszinski, D.** See Pidgeon, C. R., 505
- Javanainen, J.**
—; Lindberg, M.; Stenholm, Stig: Laser cooling of trapped ions: dynamics of the final stages, 111
- Jezierski, Krzysztof**
—; Misiewicz, Jan: Surface roughness as a physical cause of the dip in the results of a Kramers-Kronig analysis of Zn₃P₂, 850
- Jiang, Ai-dong.** See Chen, Chuang-tian, 434
- Jin, Yao-gen.** See Li, Yu-fen, 511
- Jocham, D.**
—; Unsöld, E.; Dietrich, R.; Löhrs, U.; Weinsheimer, W.: Integral photoradiation therapy of bladder cancer (A), 556
- Johnson, Bernadette.** See Walsh, John E., 531
- Jones, C.** See Moloney, Jerry V., 499
- Jori, G.**
—; Cozzani, I.; Reddi, E.; Tomio, L.; Mandoliti, G.: *In vitro* and *in vivo* studies on the mechanism of porphyrin-induced photodamage of malignant cells (A), 555
- Joshi, Y. N.** See VanKleeff, Th. A. M., 271, 795
—; VanKleeff, Th. A. M.; Sarma, V. N.: 3d⁸4s, 3d⁸4p, and 3p⁵3d¹⁰ configurations in the As VII spectrum, 279
- Judd, B. R.**
—; Crosswhite, Hannah: Orthogonalized operators for the f shell, 255
—; Suskin, M. A.: Complete set of orthogonal scalar operators for the configuration f³, 261
- Justus, B. L.** See Campillo, Anthony J., 444
- Kacenjari, S. T.** See Obenschain, S. P., 470
- Kaiser, W.** See Polland, H.-J., 429; Zinth, W., 537
- Kaminow, Ivan P.** See Tsang, Won-Tien, 448
- Kane, Tom J.** See Zhou, B. K., 438
- Kasper, B. L.** See Tsang, Won-Tien, 448
- Kasper, J. V. V.** See Adams, Horst, 710
- Kauffman, R. L.**
—; Lee, R. W.; Whitten, B. L.; Drake, R. P.; Turner, R. E.; Estabrook, K. G.; Lasinski, B. F.; Phillion, D. W.; Letts, S. A.; Campbell, E. M.: X-ray spectroscopic studies of exploding foils (A), 481
- Kaufman, Victor.** See Sugar, Jack, 218; Tech, J. L., 41
—; Sugar, Jack: Ag I-like array 4d¹⁰5s–4d⁹5s5p of I VII through Eu XVII, 38
- Keck, R. L.** See Richardson, M. C., 469
- Keilmann, F.** See Mayer, A., 549
- Kelber, Jeffery A.** See Burns, Alan R., 472
- Keller, J.-C.**
—; Le Gouët, J.-L.: Stimulated photon echo for elastic and depolarizing collision studies (A), 484
- Kelliher, M. G.** See Pidgeon, C. R., 505
- Kerhervé, François.** See Mayer, Guy, 516
- Kerker, Milton.** See Chew, Herman W., 56
- Kernahan, J. A.** See Pinnington, E. H., 30
- Ketterle, W.** See Figger, H., 493
- Kho, I. C.** See Vach, H., 509
—; Yan, P. Y.; Liu, T. H.; Shepard, S.; Hou, J. Y.: Theory and experiment on transverse intensity bistability in the transmission of a Gaussian laser beam through a nonlinear thin film (A), 477
- Kielich, S.** See Ficek, Z., 517, 882
- Kimmett, M.** See Pidgeon, C. R., 505
- Kindt, S.** See Ernst, W. E., 495
- King, D. A.** See Orr, Brian J., 503
- King, David**
Nonlinear Laser Chemistry: Multiple-Photon Excitation. Volume 22 of the Springer Series in Chemical Physics. By V. S. Letokhov (B), 411
- King, T. A.** See Xu, Gan, 515
- Kintzer, E. S.** See Mitsunaga, M., 502
- Klein, Marvin B.**
Beam coupling in undoped GaAs at 1.06 μ m using the photorefractive effect (A), 443
- Kluge, J.** See Wiechert, D., 544
- Koch, Karl.** See Hillman, Lloyd W., 440
- Kolbe, J.** See Mlynek, J., 532
- Kopeika, N. S.**
—; Ih, Charles S.; Hunsperger, R. G.: Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121
- Koroteev, N. I.** See Akhmanov, S. A., 486
- Köster, E.** See Mlynek, J., 532
- Kramer, Steven D.** See Chen, Chung H., 554
- Krasinski, Jerzy.** See Boyd, Robert W., 507; Hillman, Lloyd W., 440; Malcuit, Michelle S., 73
- Krilov, K. I.** See Altshuler, G. B., 538
- Kronfeldt, H.-D.**
—; Kropp, J.-R.; Winkler, R.: Application of the parametric description of the isotope shift to the lanthanides, 293
- Kropp, J.-R.** See Kronfeldt, H.-D., 293
- Kuhll, J.**
—; Göbel, E. O.: Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452
- Kumar, Prem.** See Shapiro, Jeffrey H., 517
- Kunz, T. D.**
—; Berry, M. J.: Laser photoacoustic spectroscopy and detection of intramolecular vibrational energy redistribution and unimolecular reaction processes (A), 541
- Kurnit, N. A.** See Slatkine, Michael, 509
- Kurz, H.** See Bloembergen, Nicolaas, 446
- Kuze, Hiroaki.** See Takami, Michio, 552
- Kwok, S. L.** See Henke, B. L., 818
- Kwong, S.**
—; Cronin-Golomb, Mark; Yariv, Amnon: Self-starting self-pumped multicolor passive-phase conjugation (A), 532
- Kyrölä, E.**
Photoexcitation of a quasi-continuum: connections to few-level dynamics, 737
- Kyumaev, K. M.** See Gromov, D. A., 431
- Ladera, C. L.** See Trebino, Rick, 549
- Lalanne, J. R.** See Freysz, E., 433
- Lam, Juan F.**
—; Steel, Duncan G.; McFarlane, Ross A.: Collision effects on Zeeman coherences using nearly degenerate four-wave mixing (A), 483
- Lange, W.** See Mlynek, J., 532
—; Mitschke, F.; Deserno, R.; Mlynek, J.: Magnetically induced relaxation oscillations in a sodium-filled Fabry-Perot resonator (A), 468
- Laporta, P.** See De Silvestri, S., 436
- Lasinski, B. F.** See Kauffman, R. L., 481
- Lau, Kam Y.**
—; Yariv, Amnon: Recent developments in very-high-speed semiconductor laser diodes (A), 460
- Laubereau, A.** See Graener, H., 503; Hartmann, H.-J., 538
- Lawandy, Nabil M.**
Laser-induced diffusion by collisional redirection and relaxation (A), 553
- LeBerre, M.** See Tai, K., 490
—; Ressayre, E.; Tallet, A.; Tai, K.; Gibbs, Hyatt M.; Rushford, M. C.; Peyghambarian, N.: Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591
- Le Boiteux, S.**
—; Raj, Rama K.; Gao, Q. F.; Bloch, Daniel; Ducloy, Martial: Exploration of high-order optical susceptibilities via angularly resolved multiwave mixing (A), 501
- Lee, Chi H.** See Strobel, Scott, 437
- Lee, Clinton.** See Stolen, Roger H., 652
- Lee, R. W.** See Kauffman, R. L., 481
- Lee, S. A.** See She, C. Y., 546
- Le Gouët, J.-L.** See Keller, J.-C., 484
- Lehmburg, R. H.** See Obenschain, S. P., 470
- Leiby, C. C., Jr.** See Hemmer, P. R., 528
- Leitner, A.** See Aussenegg, F. R., 456
- Lenstra, D.**
—; Acket, G. A.: Optical feedback in index-guided semiconductor lasers (A), 451
- Letts, S. A.** See Kauffman, R. L., 481
- Letzring, S.** See Seka, W., 480
- Levenson, Marc D.** See Corn, Robert M., 446; Milburn, G. J., 390; Romagnoli, Marco, 341, 571
Experimental difficulty of optical squeezed-state generation (A), 525
- Lewenstein, Maciej.** See Haus, Joseph W., 641
- Li, J.** See Williamson, S., 457
- Li, Yu-fen**
—; Dong, Gen-fa; Jin, Yao-gen: Investigation of nitrobenzene by

- coherent anti-Stokes Raman spectroscopy (A), 511
- Lieber, M.**
Waves and Photons—An Introduction to Quantum Optics. By Edwin Goldin (B), 324
- Lindau, Ingolf.** See Tatchyn, Roman, 806
- Lindberg, M.** See Javanainen, J., 111
- Linke, R. A.** See Tsang, Won-Tien, 448
- Liou, K.-Y.** See Dutta, N. K., 459
- Lippi, G.** See Arecchi, F. T., 497
- Lippitsch, M. E.** See Aussenegg, F. R., 456
- Littler, C. L.** See Seiler, D. G., 548
- Littman, Michael G.**
Feature issue on the symposium on atomic spectroscopy (N), 137
- Liu, T. H.** See Khoo, I. C., 477
- Lo, Wayne.** See Freed, Charles, 544
- Logan, R. A.** See Tsang, Won-Tien, 448
- Löhrs, U.** See Jocham, D., 556
- Loiza, F.** See Banash, M., 545
- Lou, Nan-quan.** See He, Guo-zhong, 511
- Loy, Michael M. T.**
—; Zacharias, H.: Time-resolved and state-selective study of vibrationally excited molecules scattering from surfaces (A), 471
- Lu, Ren-xiang**
—; Chang, Cheng-chuan: Transmission anomalies of aluminum foil irradiated by intensive laser-produced x-ray radiation (A), 481
- Luk, T. S.** See Boyer, K., 3
- Lundberg, H.** See Silfvast, William T., 429
- Lytel, Richard**
Optical multistability in collinear degenerate four-wave mixing, 91
- MacFarlane, R. M.**
—; Shelby, R. M.: Persistent spectral hole burning in $\text{CaF}_2:\text{Sm}^{2+}$ (A), 550
- Mackay, J.** See Pidgeon, C. R., 505
- MacKenzie, H. A.**
—; Wherrett, B. S.; Alattar, H. A.; Yuen, S. Y.: Nondegenerate four-wave mixing in InSb using low-power continuous-wave CO lasers (A), 500
- Macklin, John J.** See Silfvast, William T., 429
- Macleod, H. Angus**
Physics of Thin Films. Advances in Research and Development, Volume 12. Edited by Georg Hass, Maurice H. Francombe, and John L. Vossen (B), 323
- Madden, P. A.** See Scott, A. M., 432
- Madden, Robert P.**
—; Ederer, D. L.: Probing atomic and molecular processes with synchrotron radiation (A), 521
- Madey, John M. J.**
Development and applications of laboratory-scale free-electron lasers (A), 530
- Maeda, Mari W.** See Shapiro, Jeffrey H., 517
- Malcuit, Michelle S.** See Boyd, Robert W., 507
—; Boyd, Robert W.; Hillman, Lloyd W.; Krasinski, Jerzy; Stroud, Carlos R., Jr.: Saturation and inverse-saturation absorption line shapes in alexandrite, 73
- Mandel, Leonard**
Introduction to the Theory of Laser-Atom Interactions. By Marvin H. Mittleman (B), 125
Proposal for almost noise-free optical communication under conditions of high background, 108
Sub-Poissonian photon statistics and squeezed quantum states (A), 517
- Mandoliti, G.** See Jori, G., 555
- Manenkov, A. A.** See Altshuler, G. B., 538; Gromov, D. A., 431
- Manning, R. J.** See Miller, A., 428
- Marinero, E. E.**
—; Rettner, C. T.; Zare, R. N.: Determination of the $\text{H} + \text{D}_2$ product state distribution using a novel laser ionization mass spectrometer (A), 539
- Marjoribanks, R. S.** See Richardson, M. C., 469
- Mark, Hans.** See Crasemann, Bernd, 224
- Marowsky, G.** See Akhmanov, S. A., 486
—; Reider, G. A.; Schmidt, Arnold J.: Interferometric enhancement of surface-generated second-harmonic radiation (A), 447
- Marsh, J. H.** See Miller, A., 428
- Marston, Philip L.**
—; Crichton, James H.: Radiation torque on a sphere illuminated with circularly polarized light (A), 528
- Martinez, O. E.** See Gordon, J. P., 437
- Martin-Pereda, J. A.**
Nonlinear interface behavior between glass and liquid crystal (A), 512
- Maslyukov, A. P.** See Gromov, D. A., 431
- Massone, C. A.** See Tavares, A. Dias, Jr., 513
- Mataloni, P.** See Di Lazzaro, P., 447
- Mate, C. M.** See Tom, H. W. K., 446
- Mathew, J. G. H.** See Miller, A., 475
- Mattar, Farres P.** See Haake, F., 547
- Matyushin, G. A.** See Gromov, D. A., 431
- Maya, J.** See Grossman, M., 553
- Mayer, A.**
—; Keilmann, F.: Far-infrared nonlinearities of lattice vibrations and free carriers (A), 549
- Mayer, Guy**
—; Hauchecorne, Gérard; Kerhervé, François: Laser-induced electron multiplication and optical emission in high-density gases (A), 516
- Mazur, E.**
—; Burak, Itamar; Bloembergen, Nicolaas: Time-resolved Raman spectroscopy of infrared multiphoton excited molecules (A), 538
- McAfee, J. M.** See Worden, Earl F., 314
- McCullen, J. D.** See Dorsel, A., 441
- McFarlane, Ross A.** See Lam, Juan F., 483
- McIlrath, Thomas J.** See Bonin, Keith D., 52
- McIver, J. K.** See Becker, W., 523
- McKellar, A. R. W.** See Evenson, Kenneth M., 15
- McLean, E. A.** See Obenschain, S. P., 470
- McMichael, Ian C.** See Diels, Jean-Claude, 435
—; Diels, Jean-Claude: Degenerate four-wave mixing of femtosecond pulses in the saturable absorber of a ring dye laser (A), 435
- Meier, T.**
—; Schuessler, H. A.: Laser-induced fluorescence line narrowing in atomic vapors, 161
- Metcalfe, Harold J.** See Prodan, J. V., 504
Quantum Metrology and Fundamental Constants, Volume 98 of the NATO Advanced Science Institute Series. Edited by Paul Cutler and A. A. Lucas (B), 761
- Meystre, Pierre.** See Dorsel, A., 441; Eberly, Joseph H., 520
- Migus, A.**
—; Etchepare, J.; Grillon, G.; Thomazeau, I.; Antonetti, A.: Femtosecond kinetics of malachite green (A), 454
- Milburn, G. J.**
—; Walls, D. F.; Levenson, Marc D.: Quantum phase fluctuations and squeezing in degenerate four-wave mixing, 390
- Miles, R. O.** See Dandridge, Anthony, 462
- Miller, A.**
—; Manning, R. J.; Fox, A. M.; Marsh, J. H.: Ultrafast saturation recovery in GaInAsP (A), 428
—; Mathew, J. G. H.; Craig, D.; Parry, G.: Band-gap resonant Fabry-Perot nonlinearities and two-photon-induced optical switching in CdHgTe (A), 475
- Miller, D. A. B.** See Smith, P. W., 452
Optical bistability and differential gain resulting from absorption increasing with excitation, 857
—; Gossard, A. C.; Wiegmann, W.: Optical bistability from increasing absorption (A), 477
- Mills, Allen P., Jr.** See Chu, Sten, 504
- Milonni, P. W.** See Ackerhalt, Jay R., 542, 116
- Minot, C.** See Oudar, J. L., 500
- Misiewicz, Jan.** See Jezierski, Krzysztof, 850
- Mitschke, F.** See Lange, W., 468
- Mitsunaga, M.** See DeVoe, Ralph G., 527
—; Kintzer, E. S.; Mlynek, J.; Wong, N. C.; DeVoe, Ralph G.; Brewer, Richard G.: Raman heterodyne detection of nuclear magnetic resonance (A), 502
- Mlynek, J.** See Lange, W., 468; Mitsunaga, M., 502
—; Buhr, E.; Wong, N. C.; Tamm, Chr.: Amplitude- and frequency-modulation Raman heterodyne detection of optical double resonance (A), 492
—; Köster, E.; Kolbe, J.; Lange, W.: Phase conjugation with the use of transverse optical pumping (A), 532
- Moerner, W. E.** See Huston, A. L., 349; Romagnoli, Marco, 341
- Mollenaer, Linn F.**
—; Stolen, Roger H.: The soliton laser (A), 444
- Moloney, Jerry V.**
Evolution of two-dimensional transverse solitary waves and solitons in an optical bistable resonator (A), 467
—; Hammel, S.; Jones, C.: Global dynamics of Ikeda's plane-wave map (A), 499
- Montán, S.** See Ankerst, J., 558
- Mooradian, A.** See Harrison, J., 459
- Moore, B. N.** See Rosenbluth, M. N., 496
- Moosmüller, H.** See She, C. Y., 546
- Morita, Norio.** See Yajima, Tatsuo, 526
- Morrison, H. D.** See Sinclair, R. L., 439
- Mossberg, Thomas W.** See Carlson, Nils W., 506
- Mostowski, J.** See Raymer, Michael G., 547
- Mourou, Gerhard A.** See Williamson, S., 457
- Müller, W.**
—; Hertel, I. V.: Energy pooling pumped infrared laser emission in laser-excited sodium vapor (A), 508
- Munsee, J. H.** See George, Simon, 320
- Murphree, A. Linn.** See Doiron, Daniel R., 557; Gomer, Charles J., 557
- Murphy, J.**
—; Pellegrini, C.: Generation of high-intensity coherent radiation in the soft-x-ray regime (A), 530
- Murphy, William F.**
Vibrational Spectra and Structure, A Series of Advances, Volume 12. Edited by James R. Durig (B), 412
- Mysyrowicz, A.** See Chase, L. L., 533
- Nabors, C. D.** See Thomas, John E., 482
- Nakazawa, Masataka**
—; Tokuda, Masamitsu; Negishi, Yukiyasu; Uchida, Naoya: Active transmission line: light amplification by backward-stimulated Raman

- scattering in polarization-maintaining optical fiber, 80
- ; Tokuda, Masamitsu; Uchida, Naoya: Continuous-wave Raman oscillation for a Nd³⁺:YAG intracavity fiber laser, 86
- Narducci, Lorenzo, M.** See Gao, J. Y., 606
- Narozhny, N. B.** See Eberly, Joseph H., 520; Sanchez-Mondragon, J. J., 518
- Nayak, N.** See Agarwal, G. S., 515, 164
- Nechitailo, V. S.** See Gromov, D. A., 431
- Negishi, Yukiyasu.** See Nakazawa, Masataka, 80
- Neil, George R.** See Edighoffer, John A., 497
- Ness, K. M. M.** See Hutchinson, M. H. R., 519
- Newman, Daniel.** See Burkhalter, P. G., 155
- Newnam, Brian E.**
- ; Warren, R. W.; Stein, W. E.; Winston, J. G.; Sheffield, R. L.; Fraser, J. S.; Sollid, Jon E.; Goldstein, John C.; Watson, J. M.; Brau, C. A.: High-power operation of the Los Alamos free-electron laser oscillator (A), 505
- Nibler, J. W.** See Graener, H., 503
- Nielsen, Ulrik**
- ; Thorsen, Per; Poulsen, Ove; Crosswhite, Hannah: ²³⁵U II hyperfine structures measured by collinear fast-beam-laser and radio-frequency-laser double-resonance spectroscopy, 284
- Nunzi, J. M.**
- ; Ricard, D.: Optical phase conjugation with surface plasma waves (A), 458
- Nuss, M.** See Zinth, W., 537
- Obenschain, S. P.**
- ; Grun, J.; Herbst, M. J.; Lehmborg, R. H.; Pronko, M. S.; Young, F. C.; Bodner, S. E.; Gardner, J. H.; Kacenjars, S. T.; McLean, E. A.; Ripin, B. H.; Schmitt, A.; Stamper, J. A.; Whitlock, R. R.: Interaction of an incoherent laser with planar targets (A), 470
- O'Connell, R. M.**
- ; Romberger, A. B.; Shaffer, A. A.; Saito, Theodore T.; Deaton, Terence F.; Seigenthaler, K. E.; Seiler, Frank J.: Improved laser-damage-resistant polymethyl methacrylate, 853
- Oesterhelt, D.** See Polland, H.-J., 429
- Ogawa, Yoh.** See Okumura, Kenichiro, 465
- Ohkouchi, S.** See Ibaraki, A., 463
- Okumura, Kenichiro**
- ; Ogawa, Yoh; Ito, Hiromasa; Inaba, Humio: Optical bistability and monolithic logic functions based on bistable-laser light-emitting diodes (A), 465
- Olsson, N. A.** See Dutta, N. K., 459; Tsang, Won-Tien, 448
- Orr, Brian J.**
- ; Duval, A. B.; Haines, R.; Isenor, N. R.; King, D. A.: Fluorescence-detected Raman-optical double-resonance spectroscopy (A), 503
- Ortęga, J. M.**
- ; Elleaume, P.; Billardon, M.; Bazin, C.; Bergher, M.; Velghe, M.; Petroff, Yves: Visible free-electron laser at Orsay (A), 496
- Osgood, R. M., Jr.** See Chen, C. J., 474
- Oudar, J. L.**
- ; Abram, I.; Minot, C.; Dubard, J.: Picosecond optical saturation and four-wave mixing in GaAs transient electron-hole plasma (A), 500
- Paisner, J. A.** See Worden, Earl F., 314
- Palmer, Byron A.** See Engleman, Rolf, Jr., 782
- ; Engleman, Rolf, Jr.: Wavelengths and energy levels of doubly ionized uranium (U III) obtained using a Fourier-transform spectrometer, 609
- Palmer, M. A.** See Henke, B. L., 828
- Pantell, R. H.** See Grover, L. K., 524
- Paoli, T. L.** See Burnham, Robert D., 542
- Parry, G.** See Miller, A., 475
- Partin, Dale L.** See Freed, Charles, 544
- Paul, H.** See Brunner, W., 487
- Pellegrini, C.** See Murphy, J., 530
- Pefina, J.** See Teich, Malvin C., 366
- Petroff, Yves.** See Ortęga, J. M., 496
- Peyghambarian, N.** See Le Berre, M., 591; Tai, K., 490
- Pfeuffer, V.** See Childs, W. J., 22
- ; Childs, W. J.; Goodman, L. S.: *J* dependence of the isotope shift in the ground term of dysprosium I, 34
- Phillips, D. W.** See Kauffman, R. L., 481
- Phillips, William D.** See Prodan, J. V., 504
- Philpott, Michael R.** See Corn, Robert M., 446
- Pianarosa, P.**
- ; Demers, Y.; Gagné, Jean-Marie: Isotopic analysis by optogalvanic spectroscopy, 704
- Pidgeon, C. R.**
- ; Smith, S. D.; Firth, W. J.; Jaroszinski, D.; Tratt, D. M.; Mackay, J.; Kimmitt, M.; Reid, J. M.; Kelliher, M. G.; Poole, M. W.; Saxon, G.; Walker, R. P.: United Kingdom free-electron laser project (A), 505
- Piestrup, M. A.**
- ; Fauchet, A. M.: Media free-electron lasers (A), 531
- Pinard, M.** See Grynberg, G., 501
- Pinnington, E. H.**
- ; Ansbacher, W.; Kernahan, J. A.: Energy-level and lifetime measurements for Kr VII, 30
- Polacco, E.** See Carusotto, S., 635
- Polland, H.-J.**
- ; Franz, M. A.; Zinth, W.; Kaiser, W.; Hegemann, P.; Oesterhelt, D.: Picosecond measurements on halorhodopsin of halobacterium halobium (A), 429
- Poole, C. D.**
- ; Garmire, Elsa M.: Nonlinear refraction at the band gap in InAs (A), 475
- Poole, M. W.** See Pidgeon, C. R., 505
- Popović, M. V.**
- ; Ćirković, Lj.; Janevski, Z.: High-gain recombination laser produced by CO₂ laser-vaporized target material (A), 515
- Poulligny, B.** See Freys, E., 433
- Poulsen, Ove.** See Nielsen, Ulrik, 284
- Pratt, S. T.** See Dehmer, J. L., 495
- Prodan, J. V.**
- ; Phillips, William D.; Metcalf, Harold J.; Dalibard, J.: Stopping neutral atoms using laser light (A), 504
- Profio, A. E.**
- ; Sarnaik, J.; Wudl, L. R.: Laser-excited fluorescence for diagnosis of cancer (A), 559
- Prokhorov, A. M.** See Altshuler, G. B., 538; Gromov, D. A., 431
- Pronko, M. S.** See Obenschain, S. P., 470
- Pummer, H.** See Boyer, K., 3; Jara, H., 551
- Putnam, R. S.**
- Limits to pulse advance and delay in mode-locked lasers, 771
- Quail, J. C.**
- ; Simon, H. J.: Optical second-harmonic generation in transmission with long-range surface plasmons (L), 317
- Quick, D.** See Seka, W., 480
- Raimond, J. M.** See Haroche, S., 518
- Raj, Rama K.** See Le Boiteux, S., 501
- Rajnak, K.** See Van Deurzen, C. H. H., 45
- Raymer, Michael G.** See Sizer, T., II, 483; Trippenbach, M., 671; Westling, L. A., 150
- ; Walmsley, I. A.; Mostowski, J.; Sobolewska, Bozena: Quantum theory of Stokes pulse energy fluctuations (A), 547
- Razum, Nicholas J.** See Doiron, Daniel R., 557; Gomer, Charles J., 557
- Reader, Joseph.** See Acquista, Nicolo, 649; Goldsmith, Samuel, 631
- Reddi, E.** See Jori, G., 555
- Reibold, R.** See Haake, F., 547
- Reid, J. M.** See Pidgeon, C. R., 505
- Reid, John.** See Sinclair, R. L., 439
- Reid, M. D.**
- ; Walls, D. F.: Bell's inequalities in quantum optics (A), 547
- ; Walls, D. F.: Quantum statistics of degenerate four-wave mixing (A), 525
- Reider, G. A.** See Marowsky, G., 447
- Reintjes, J. F.** See Dlabal, M. L., 522
- Ren, Ji-lun.** See He, Guo-zhong, 511
- Ressayre, E.** See Le Berre, M., 591; Tai, K., 490
- Rettner, C. T.** See Marinero, E. E., 539
- Rhodes, Charles K.** See Boyer, K., 3; Jara, H., 551
- VUV and XUV generation with multiphoton excitation (A), 521
- Rhodes, W.** See Cardamone, M. J., 779
- Ricard, D.** See Nunzi, J. M., 458
- Rice, James K.** See Burns, Alan R., 472
- Richardson, M. C.** See Seka, W., 480; Tanaka, K., 480
- ; Barnouin, O.; Craxton, R. S.; Delettrez, J.; Keck, R. L.; Marjoribanks, R. S.; Seka, W.; Soures, J. M.; Yaakobi, B.: Absorption physics at 351 nm in spherical geometry (A), 469
- Riegler, M.** See Aussenegg, F. R., 456
- Ripin, B. H.** See Obenschain, S. P., 470
- Rockett, Paul D.** See Burkhalter, P. G., 155
- Rockwood, Stephen D.**
- Overview of research within the U.S. inertial fusion program (A), 469
- Roh, Won B.** See Cleis, Richard A., 774
- Rokni, M.**
- ; Flusberg, Allen: Laser-controlled optics using nonlinear dispersion in gaseous media (A), 491
- Rolland, C.** See Sinclair, R. L., 439
- Romagnoli, Marco.** See Corn, Robert M., 446
- ; Levenson, Marc D.; Bjorklund, Gary C.: Frequency-modulation polarization-spectroscopy detection of persistent spectral holes, 571
- ; Moerner, W. E.; Schellenberg, F. M.; Levenson, Marc D.; Bjorklund, Gary C.: Beyond the bottleneck: submicrosecond hole burning in phthalocyanine, 341
- Romberger, A. B.** See O'Connell, R. M., 853
- Rosasco, G. J.**
- ; Hurst, W. S.: Measurement of the third-order susceptibility by phase-modulated nonlinear Raman spectroscopy (A), 545
- Rosenbluth, M. N.**
- Electromagnetic instabilities in free-electron lasers (A), 506
- ; Wong, H. Vernon; Moore, B. N.: Storage-ring operation of free-electron lasers with phase-area displacement wiggler (A), 496

- Rossmann, Robert**
Diagnostics of relativistic electron beams with lasers (A), 532
- Rottke, H.**
—; Welge, K. H.: State-selective two-step laser spectroscopy of the hydrogen atom and molecule (A), 485
- Roy, Rajarshi**
Concepts of Quantum Optics. By P. L. Knight and L. Allen (B), 761
- Rudolph, V.** See Diels, Jean-Claude, 435
- Rushford, M. C.** See Le Berre, M., 591; Tai, K., 490
- Ryabtsev, Aleksandr N.** See VanKleef, Th. A. M., 795
- Rzǎżewski, Kazimierz.** See Haus, Joseph W., 641; Trippenbach, M., 671
- Sacchi, C. A.** See Bottioli, G., 556
- Saito, Theodore T.** See O'Connell, R. M., 853
- Saleh, Bahaa, E. A.** See Teich, Malvin C., 366
- Sanchez-Mondragon, J. J.** See Eberly, Joseph H., 520
—; Narozhny, N. B.; Eberly, Joseph H.: Spontaneous vacuum line splitting in a cavity (A), 518
- Sanders, G. A.**
—; Ezekiel, Shaoul: Measurement of Fresnel drag in moving media using a ring-resonator technique (A), 528
- Sanders, L. D.** See Derstine, M. W., 464
- Sandle, W. J.** See Satchell, J. S., 491
- Sansonetti, Craig J.**
—; Weber, K.-H.: Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361
- Sargent, Murray, III.** See Stuet, Stephen, 95
- Sarma, V. N.** See Joshi, Y. N., 279
- Sarnaik, J. S.** See Profio, A. E., 559
- Satchell, J. S.**
—; Ballagh, R. J.; Sandle, W. J.: Observation of self-focusing via saturable absorption in atomic Na (A), 491
- Saunders, F. C.** See Scott, A. M., 432
- Saxon, G.** See Pidgeon, C. R., 505
- Schäfer, B.** See Hess, P., 474
- Schäfer, Fritz P.** See Szatmári, Sandor, 453
- Schawlow, Arthur L.** See Zhang, Pei-Lin, 530, 9
- Schellenberg, F. M.** See Romagnoli, Marco, 341
- Schenzle, A.** See DeVoe, Ralph G., 527
- Schmidt, Arnold J.** See Marowsky, G., 447
- Schmitt, A.** See Obenschain, S. P., 470
- Schoen, P. E.** See Campillo, Anthony J., 444
- Schrepp, W.** See Figger, H., 493
- Schröder, J. O.** See Ernst, W. E., 495
- Schuessler, H. A.** See Meier, T., 161
- Schumaker, Bonny L.**
—; Caves, Carlton M.: Two-mode formalism for two-photon optics (A), 524
- Scifres, Donald R.** See Burnham, Robert D., 542
- Scott, A. M.**
—; Madden, P. A.; Saunders, F. C.: Nonlinear optical susceptibilities of binary mixtures of liquid crystals (A), 432
- Scully, Marlan O.** See Elçi, A., 432
- Scuri, F.** See Carusotto, S., 635
- Searle, C. M.** See Gioggia, R. S., 499
- Sears, Trevor J.** See Evenson, Kenneth M., 15
Molecular Ions Geometric and Electronic Structures. Volume 90 of NATO ASI Series B in Physics. Edited by Joseph Berkowitz and Karl-Ontjes Groeneveld (B), 324
- Seaton, Colin T.** See Vach, H., 509
- Seigenthaler, K. E.** See O'Connell, R. M., 853
- Seiler, D. G.**
—; Littler, C. L.; Heiman, D.: Two-photon spectroscopy of GaAs (A), 548
- Seiler, Frank J.** See O'Connell, R. M., 853
- Seka, W.** See Richardson, M. C., 469; Tanaka, K., 480
—; Short, R. W.; Goldman, L. M.; Letzring, S.; Richardson, M. C.; Soures, J. M.; Tanaka, K.; Craxton, R. S.; Delettrez, J.; Boni, R.; Quick, D.: Half-integer harmonic emission from laser plasmas as a coronal temperature diagnostic (A), 480
- Senitzky, I. R.**
Phase correlation in cascade spontaneous emission by a multilevel system: atomic memory, 879
- Shaffer, A. A.** See O'Connell, R. M., 853
- Shank, Charles V.** See Tomlinson, W. J., 139
- Shapiro, Jeffrey H.**
—; Kumar, Prem; Maeda, Mari W.: Quantum noise and the detection of squeezed states (A), 517
- Sharfin, W. F.** See Dagenais, M., 476
- Shaw, E. D.**
—; Chichester, R. J.: Free-electron laser project at AT&T Bell Laboratories (A), 497
- She, C. Y.**
—; Herring, G. C.; Moosmüller, H.; Lee, S. A.: Stimulated Rayleigh-Brillouin gain spectroscopy in pure gases and gas mixtures (A), 546
- Sheffield, R. L.** See Newnam, Brian E., 505
- Shelby, R. M.** See MacFarlane, R. M., 550
- Shen, Guan-lin.** See He, Guo-zhong, 511
- Shen, Y. R.** See Heinz, T. F., 432; Tom, H. W. K., 446; Yang, Guo-zhen, 443
- Shepard, S.** See Khoo, I. C., 477
- Shimizu, Fujio**
—; Shimizu, Kazuko; Takuma, Hiroshi: Subnatural linewidth laser spectroscopy (A), 537
- Shimizu, Kazuko.** See Shimizu, Fujio, 537
- Shin, San-Yung.** See Song, Jae-Won, 488
- Shore, Bruce W.** See Wódkiewicz, K., 506, 398, 759
Modeling noise by jump processes in strong laser-atom interactions, 176
- Short, R. W.** See Seka, W., 480; Tanaka, K., 480
- Shumay, I. L.** See Akhmanov, S. A., 486
- Siegman, A. E.** See Fauchet, P. M., 455; Trebino, Rick, 549
- Sievers, A. J.** See Gosnell, T. R., 430
- Silberberg, Yaron.** See Bar-Joseph, Israel, 498
—; Bar-Joseph, Israel: Optical instabilities in a nonlinear Kerr medium, 662
- Silfvast, William T.**
—; Wood, Obert R., II; Lundberg, H.; Macklin, John J.: High-gain lasers excited by inner-shell photoionization from broadband soft-x-ray laser-produced-plasma sources (A), 429
- Simon, H. J.** See Quail, J. C., 317
- Surface Polaritons: Electromagnetic Waves at Surfaces and Interfaces.** Edited by V. M. Agranovich and D. L. Mills (B), 410
- Simoni, F.** See Diels, Jean-Claude, 435
- Sinclair, R. L.**
—; Reid, John; Garside, Brian K.; Rolland, C.; Morrison, H. D.: Dynamics of continuous-wave NH₃ lasers as measured with a tunable diode laser (A), 439
- Sipe, J. E.** See van Driel, H. M., 455
- Sizer, T., II**
—; Raymer, Michael G.: Picosecond optical collisions (A), 483
- Skeldon, Mark D.** See Brukilacchio, Thomas J., 354
- Slatkine, Michael**
—; Bigio, Irving J.; Kurnit, N. A.; Watkins, D. E.: Pulse compression of excimer radiation by backward-stimulated Brillouin scattering in gaseous media (A), 509
- Slusher, R. E.**
—; Yurke, Bernard; Valley, J. F.: Experimental study of squeezed states using four-wave mixing in a cavity configuration (A), 525
- Smith, A. V.**
Tunable resonant enhancement in nonlinear optical-frequency mixing (A), 522
- Smith, P. W.**
—; Miller, D. A. B.; Eilenberger, D. J.: Passive mode locking of semiconductor-laser diodes (A), 452
- Smith, S. D.** See Pidgeon, C. R., 505
- Smith, Todd.** See Edighoffer, John A., 497
- Sobolewska, Bozena.** See Raymer, Michael G., 547
- Sollid, Jon E.** See Newnam, Brian E., 505
- Sollner, T. C. L. G.**
Electromagnetic Waves in Matter, Part 1, Volume 8 of Infrared and Millimeter Waves. Edited by Kenneth J. Button (B), 676
- Millimeter Components and Techniques, Part 1, Volume 9 of Infrared and Millimeter Waves.** Edited by Kenneth J. Button (B), 676
- Somorjai, G. A.** See Tom, H. W. K., 446
- Song, Jae-Won**
—; Yoon, Tae-Hoon; Shin, San-Yung: Chaotic sequence and a simple model of return map in a driven nonlinear oscillator using a light-emitting diode (A), 488
- Sorokin, P. P.** See Glowina, J. H., 545
- Soures, J. M.** See Richardson, M. C., 469; Seka, W., 480; Tanaka, K., 480
- Spaeth, M. L.**
Atomic-vapor laser isotope separation at Lawrence Livermore National Laboratory (A), 552
- Spano, F.** See Banash, M., 545
- Sprangle, P.** See Tang, Cha-Mei, 506
- Squicciarini, M. F., Jr.** See Gao, J. Y., 606
- Stamper, J. A.** See Obenschain, S. P., 470
- Stark, J.** See Bokor, Jeffrey, 529
- Steel, Duncan G.** See Lam, Juan F., 483
- Stefanini, G.** See Carusotto, S., 635
- Stegeman, George I.** See Vach, H., 509
- Stein, W. E.** See Newnam, Brian E., 505
- Stenholm, Stig.** See Javanainen, J., 111
Statistical mechanics of light-induced forces, 658
- Stolen, Roger H.** See Mollenauer, Linn F., 444; Tomlinson, W. J., 139
—; Lee, Clinton; Jain, R. K.: Development of the stimulated Raman spectrum in single-mode silica fibers, 652
- Stone, J. P.**
Laser Processing and Analysis of Materials. By W. W. Duley (B), 760
- Stone, Julian.** See Chraplyvy, A. R., 430
- Storz, R. H.** See Bokor, Jeffrey, 529
- Streifer, William.** See Burnham, Robert D., 542
- Strobel, Scott**
—; Lee, Chi H.; Burdge, Geoffrey: Continuous-wave mode-locked Nd: phosphate glass laser (A), 437
- Stroud, Carlos R., Jr.** See Hillman, Lloyd W., 440; Malcuit, Michelle S., 73
- Stuet, Stephen**
—; Sargent, Murray, III: Effects of

- Gaussian-beam averaging on phase conjugation and beat-frequency spectroscopy, 95
- Suckewer, S.** See Denne, B., 296
- Suematsu, Yasuharu.** See Asada, Masahiro, 450
- Sugar, Jack.** See Kaufman, Victor, 38; Tech, J. L., 41
- ; Kaufman, Victor: Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218
- Sullivan, B. J.** See Whittaker, E. A., 494
- Sung, C. C.** See Haus, Joseph W., 742
- ; Bowden, Charles M.: Effects of mirror reflectivity in excitonic optical bistability, 395
- ; Hans, J. W.; Bowden, Charles M.: Transient behavior of excitonic semiconductor optical bistability (A), 476
- Suskin, M. A.** See Judd, B. R., 261
- Svaasand, Lars O.**
Cancer treatment with laser irradiation and tumor-seeking photosensitizers (A), 555
- Svanberg, K.** See Ankerst, J., 558
- Svanberg, Sune.** See Ankerst, J., 558
- Svelto, O.** See Andreoni, A., 556; De Silvestri, S., 436
- Swettman, Alan.** See Edighoffer, John A., 497
- Szabo, A. G.**
—; Heber, J.: Optically induced homogeneous line narrowing (A), 550
- Szatmári, Sandor**
—; Schäfer, Fritz P.: Picosecond gain dynamics in KrF (A), 453
- Tai, K.** See Le Berre, M., 591
- ; Gibbs, Hyatt M.; Rushford, M. C.; Peyghambarian, N.; LeBerre, M.; Ressayre, E.; Tallet, A.: Observation of continuous-wave on-resonance enhancement (A), 490
- Takami, Michio**
—; Kuze, Hiroaki: Cold-jet infrared absorption spectroscopy of heavy-metal compounds (A), 552
- Takuma, Hiroshi.** See Shimizu, Fujio, 537
- Tallet, A.** See Le Berre, M., 591; Tai, K., 490
- Tamm, Chr.** See Mlynek, J., 492
- Tanaka, K.** See Seka, W., 480
- ; Boswell, B.; Craxton, R. S.; Goldman, L. M.; Richardson, M. C.; Seka, W.; Short, R. W.; Sources, J. M.: Self-focusing in underdense ultraviolet laser-produced plasmas (A), 480
- Tanaš, R.** See Ficek, Z., 517, 882
- Tang, C. L.** See Erskine, D. J., 427; Xu, Z. Y., 536
- Tang, Cha-Mei**
—; Sprangle, P.: Effect of betatron oscillations on the three-dimensional radiation fields in a free-electron laser oscillator (A), 506
- Tankersley, L. L.** See Dlabal, M. L., 522
- Tatchyn, Roman**
—; Csonka, Paul L.; Lindau, Ingolf: Outline of a variational formulation of zone-plate theory, 806
- Tavares, A. Dias, Jr.**
—; Fellows, C. E.; Massone, C. A.: New simple model for high-power pulsed gas lasers (A), 513
- Taylor, A. J.** See Erskine, D. J., 427
- Tech, J. L.**
—; Kaufman, Victor; Sugar, Jack: Rh I isoelectronic sequence: analysis of the $4d^9-4d^8 5p$ transition array in La XIII, 41
- Teich, Malvin C.**
—; Saleh, Bahaa, E. A.; Peřina, J.: Role of primary excitation statistics in the generation of antibunched and sub-Poisson light, 366
- Teng, C. C.** See Wong, King-Young, 434
- Terhune, Robert W.**
From the Editor (N), 1
- Tester, M. A.** See Henke, B. L., 828
- Thomas, John E.**
Foundations of Laser Spectroscopy. By Stig Stenholm (B), 676
- ; Ghosh, A. P.; Nabors, C. D.; Attili, M.; Forber, R. A.; Feld, M. S.: Quantum superposition state scattering in ytterbium (A), 482
- Thomazeau, I.** See Migus, A., 454
- Thorsen, Per.** See Nielsen, Ulrik, 284
- Timberlake, J.** See Denne, B., 296
- Timmermann, A.** See Beigang, R., 519
- Tittel, F. K.** See Adams, Horst, 710
- Tkach, R. W.** See Gosnell, T. R., 430
- Tokuda, Masamitsu.** See Nakazawa, Masataka, 80, 86
- Tom, H. W. K.** See Heinz, T. F., 432
- ; Mate, C. M.; Zhu, X. D.; Crowell, J. E.; Heinz, T. F.; Somorjai, G. A.; Shen, Y. R.: Studies of atomic and molecular adsorption on surfaces in ultrahigh vacuum (A), 446
- Tomaschke, H. E.** See Bryan, D. A., 442
- Tomio, L.** See Jori, G., 555
- Tomlinson, W. J.**
—; Stolen, Roger H.; Shank, Charles V.: Compression of optical pulses chirped by self-phase modulation in fibers, 139
- Tornos, J.** See Bernabeu, E., 586
- Törring, T.** See Ernst, W. E., 495
- Townes, C. H.**
Quantum electronics—where we have been and where we may go (A), 464
- Tratt, D. M.** See Pidgeon, C. R., 505
- Trebino, Rick**
—; Siegman, A. E.; Ladera, C. L.: Suppression of thermal gratings in polarization spectroscopy (A), 549
- Tredicce, J. R.** See Arecchi, F. T., 497
- Tripathy, S. K.** See Carter, Gary M., 458
- Trippenbach, M.**
—; Rzażewski, Kazimierz; Raymer, Michael G.: Stimulated Raman scattering of colored chaotic light, 671
- Truong, Vo-Van.** See Girouard, Fernand E., 76
- Tsang, Won-Tien**
—; Olsson, N. A.; Logan, R. A.; Linke, R. A.; Kasper, B. L.; Kaminow, Ivan P.: Cleaved-coupled-cavity (C³) semiconductor lasers (A), 448
- Tsaur, Bor-Yeu**
Treatise on Materials Science and Technology. Volume 24 of Preparation and Properties of Thin Films. Edited by K. N. Tu and R. Rosenberg (B), 410
- Turner, R. E.** See Kauffman, R. L., 481
- Uchida, Naoya.** See Nakazawa, Masataka, 80, 86
- Uejoi, J. Y.** See Henke, B. L., 818
- Umeda, Tokuo.** See Cho, Yoshio, 497
- Underwood, James H.** See Barbee, Troy W., Jr., 691
- Unsöld, E.** See Jocham, D., 556
- Vach, H.** See Häger, J., 472
- ; Seaton, Colin T.; Stegeman, George I.; Khoo, I. C.: Observation of intensity-dependent guided waves (A), 509
- Vahala, Kerry**
—; Yariv, Amnon: Detuned loading in coupled-cavity semiconductor lasers—effect on quantum noise and dynamics (A), 510
- ; Yariv, Amnon: Quantum treatment of semiconductor laser noise (A), 461
- Valentin, S.** See Di Bona, G., 471
- Valero, Francisco P. J.** See Giver, Lawrence P. M., 715
- Valley, George C.**
Two-wave mixing with an applied field and a moving grating, 868
- Valley, J. F.** See Slusher, R. E., 525
- Van Deurzen, C. H. H.**
—; Rajnak, K.; Conway, John G.: Uranium five (U V), the 1S_0 level, and a parametric analysis of the $5f^2$ configuration, 45
- van Driel, H. M.**
—; Sipe, J. E.: Laser-induced coherent microstructures on solid and liquid surfaces (A), 455
- VanKleef, Th. A. M.** See Joshi, Y. N., 279
- ; Barakat, M. M.; Ryabtsev, Aleksandr N.; Joshi, Y. N.: Eighth spectrum of antimony: Sb VIII. Revised 2D interval: Sb VII, 795
- ; Joshi, Y. N.: Extended analyses of Se VII and Se VIII, 271
- Velghe, M.** See Ortéga, J. M., 496
- Verges, J.** See George, Simon, 320
- Verkerk, P.** See Grynberg, G., 501
- von der Linde, D.** See Wiechert, D., 454
- Walker, R. P.** See Pidgeon, C. R., 505
- Wallerstein, George**
Spectroscopy of heavy elements in stars, 307
- Walls, D. F.** See Milburn, G. J., 390; Reid, M. D., 525, 547
- Walmsley, I. A.** See Raymer, Michael G., 547
- Walsh, John E.**
—; Johnson, Bernadette: Far-infrared Cerenkov masers (A), 531
- Walther, Herbert.** See Dorsel, A., 441; Figger, H., 493; Häger, J., 472
- Wang, Dau-Sing.** See Chew, Herman W., 56
- Wang, Xiu-yan.** See He, Guo-zhong, 511
- Wang, Y.-C.** See Zhang, Pei-Lin, 9
- Wang, Yu-zhu**
High-spatial-resolution spectroscopic technique for measuring hyperfine structure of atoms and molecules (A), 512
- Warburton, William K.** See Barbee, Troy W., Jr., 691
- Warren, R. W.** See Newnam, Brian E., 505
- Warren, W. S.** See Banash, M., 545
- Watkins, D. E.** See Slatkine, Michael, 509
- Watson, J. K. G.** See Figger, H., 493
- Watson, J. M.** See Newnam, Brian E., 505
- Weber, K.-H.** See Fajonetti, Craig J., 361
- Weiner, A. M.** See Fujimoto, James G., 435
- Weinsheimer, W.** See Jocham, D., 556
- Weisbuch, C.**
Basic properties of quantum wells (A), 542
- Welge, K. H.** See Rottke, H., 485
- Wendt, H. R.** See Whittaker, E. A., 494
- Wenzel, Robert G.**
—; Drühl, K. J.; Carlsten, J. L.: Induced solitons in stimulated Raman scattering (A), 445
- Westling, L. A.**
—; Raymer, Michael G.: Single-shot spectral measurements and mode correlations in a multimode pulsed dye laser, 150
- Wheeler, G. L.** See Hyer, R. C., 429
- Wherrett, B. S.** See MacKenzie, H. A., 500
- Scaling rules for multiphoton interband absorption in semiconductors, 67
- Whitlock, R. R.** See Obenschain, S. P., 470

- Whittaker, E. A.**
—; Sullivan, B. J.; Bjorklund, Gary C.; Wendt, H. R.; Hunziker, H. E.: ND₄ Schuler-band absorption and other scientific applications of frequency-modulation spectroscopy (A), 494
- Whitten, B. L.** See Kauffman, R. L., 481
- Wiechert, D.**
—; Kluge, J.; von der Linde, D.: Characterization of fluctuations in a synchronously mode-locked dye laser (A), 454
- Wiegmann, W.** See Miller, D. A. B., 477
- Wieman, Carl E.**
Parity violation in atoms (A), 527
- Wilhelmi, B.** See Diels, Jean-Claude, 435
- Williamson, S.**
—; Mourou, Gerhard A.; Li, J.: Time-resolved laser-induced phase transformation in aluminum (A), 457
- Winful, Herbert G.** See Dagenais, M., 476
- Winkler, R.** See Kronfeldt, H.-D., 293
- Winston, J. G.** See Newnam, Brian E., 505
- Wódkiewicz, K.**
Handbook of Stochastic Methods. Volume 13 of the Springer Series in Synergetics. By C. W. Gardiner (B), 409
Squeezed quantum fluctuations in free-motion and harmonic oscillation (A), 517
—; Eberly, Joseph H.; Shore, Bruce W.: Phase and frequency jump theory of laser band shape (A), 506
—; Shore, Bruce W.; Eberly, Joseph H.: Pre-Gaussian noise in strong laser-atom interactions, 398, (errata), 759
- Wolfe, R.** See Greene, Benjamin I., 427
- Wong, H. Vernon.** See Rosenbluth, M. N., 496
- Wong, King-Young**
—; Teng, C. C.; Garito, A. F.: Third-order nonlinear optical susceptibility of conjugated liquid-crystal polymers (A), 434
- Wong, N. C.** See Mitsunaga, M., 502; Mlynek, J., 492
- Wood, Obert R., II.** See Silfvast, William T., 429
- Worden, Earl F.** See Conway, John G., 788
—; Comaskey, Brian; Densberger, J.; Christensen, J.; McAfee, J. M.; Paisner, J. A.; Conway, John G.: Ionization potential of neutral iron, Fe I, by multistep laser spectroscopy, 314
- Wright, E.** See Dorsel, A., 441
- Wright, E. M.** See Firth, W. J., 489
- Wu, Bai-chang.** See Chen, Chuang-tian, 434
- Wu, Shin-Tson**
Wavelength-tunable phase retardation plate (A), 516
- Wudl, L. R.** See Profio, A. E., 559
- Wummer, Joel**
—; Gustafson, T. K.: Dual metal-insulator-semiconductor junction phototransistor (A), 508
- Wynne, James J.**
Polarization renormalization due to nonlinear optical generation (A), 492
- Xu, Gan**
—; King, T. A.: Degenerate self-induced transparency on magnetic-dipole transitions with applications (A), 515
- Xu, Z. Y.**
—; Tang, C. L.: Picosecond relaxation of hot carriers in GaAs/AlGaAs multiple-quantum-well structures under high excitations (A), 536
- Xu, Zhizhan**
Progress of laser-plasma interaction research (A), 469
- Yaakobi, B.** See Richardson, M. C., 469
- Yajima, Tatsuo**
—; Morita, Norio; Ishida, Yuzo: Ultrahigh time-resolution coherent transient spectroscopy with incoherent or phase-modulated light (A), 526
- Yamada, H. T.** See Henke, B. L., 818
- Yamanaka, Chiyoe**
Laser fusion in new types of targets (A), 479
- Yamanoi, Montoomi**
—; Eberly, Joseph H.: Relaxation terms for strong-field optical Bloch equations, 751
- Yan, P. Y.** See Khoo, I. C., 477
- Yang, Guo-zhen**
—; Shen, Y. R.: Spectral broadening of picosecond pulses in a nonlinear medium (A), 443
- Yariv, Amnon.** See Kwong, S., 532; Lau, Kam Y., 460; Vahala, Kerry, 461, 510
- Ye, Pexuan.** See Chu, Guiyin, 526
- Yeastedt, M.** See Cardamone, M. J., 779
- Yergeau, F.** See Chin, S. L., 505
- Yoo, H.-I.** See Eberly, Joseph H., 520
- Yoon, Tae-Hoon.** See Song, Jae-Won, 488
- You, Gui-ming.** See Chen, Chuang-tian, 434
- Young, F. C.** See Obenschain, S. P., 470
- Young, G. C.** See Henke, B. L., 818
- Yuan, Jia-Yong.** See Hillman, Lloyd W., 440
- Yuen, S. Y.** See MacKenzie, H. A., 500
- Yurke, Bernard.** See Slusher, R. E., 525
Four-wave mixer and parameter amplifier cavity configurations suitable for squeezed-state generation (A), 510
- Zachara, Stanislaw.** See Heldt, Jozef, 48
- Zacharias, H.** See Loy, Michael M. T., 471
- Zadkov, V. N.** See Akhmanov, S. A., 486
- Zare, R. N.** See Marinero, E. E., 539
- Zavattini, E.** See Carusotto, S., 635
- Zhang, Heyi**
—; Gao, Ping; He, Xuehua: Experimental study of nonlinear interface between glass and liquid crystal (A), 457
- Zhang, Pei-Lin**
—; Schawlow, Arthur L.: Two-photon resonant optical processes in atomic potassium (A), 530
—; Wang, Y.-C.; Schawlow, Arthur L.: Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9
- Zhang, Zhiguo.** See Chu, Guiyin, 526
- Zhizhan, Xu.** See Xu, Zhizhan
- Zhou, B. K.**
—; Kane, Tom J.; Byer, Robert L.: Frequency jitter and linewidth of a single-mode monolithic Nd:YAG laser (A), 438
- Zhu, Huanan.** See Chu, Guiyin, 526
- Zhu, X. D.** See Heinz, T. F., 432; Tom, H. W. K., 446
- Zinth, W.** See Polland, H.-J., 429
—; Nuss, M.; Kaiser, W.: Line narrowing by transient coherent Raman spectroscopy with tunable picosecond excitation (A), 537
- Zubairy, M. Suhail.** See Elçi, A., 432

Subject Index to Volume 1, 1984

Absorption

- Cold-jet infrared absorption spectroscopy of heavy-metal compounds (A), 552
 Femtosecond relaxation dynamics in magnetic garnets (A), 427
 ND₄ Schuler-band absorption and other scientific applications of frequency-modulation spectroscopy (A), 494
 Nitric-acid band intensities and band-model parameters from 610 to 1760 cm⁻¹, 715
 Observation of self-focusing via saturable absorption in atomic Na (A), 491
 Oscillator strengths for neutral atomic uranium, 300
 Picosecond measurements on halorhodopsin of halobacterium halobium (A), 429
 Sensitivity improvement of tone-burst modulated spectroscopy with a color-center laser, 710

Antimony

- Eighth spectrum of antimony: Sb VIII.
 Revised ²D interval: Sb VII, 795

Arsenic

- 3d⁸4s, 3d⁸4p, and 3p⁵3d¹⁰ configurations in the As VII spectrum, 279
 Predicted wavelengths and transition rates for magnetic-dipole transitions within 3s²3pⁿ ground configurations of ionized Cu to Mo, 218

Astronomy

- See also specific instruments or topics
 Hyperfine structure and the broadening of sunspot spectral lines, 311
 Spectroscopy of heavy elements in stars, 307

Atoms

- Introduction to the Theory of Laser-Atom Interactions. By Marvin H. Mittleman (B), Reviewed by Mandel, Leonard, 125
 Photochemical enrichment of ¹⁹⁶Hg (A), 553

Barium

- Ag I-like array 4d¹⁰5s-4d⁹5s5p of I VII through Eu XVII, 38
 Discrete 4d photoabsorption spectrum of Ba²⁺, 626
 Multichannel-quantum-defect theory wave functions of Ba tested or improved by laser measurements, 239

Beams

- See also Lasers
 Beam coupling in undoped GaAs at 1.06 μm using the photorefractive effect (A), 443
 Beam propagation and optical power limiting with nonlinear media, 729
 Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591
 Diagnostics of relativistic electron beams with lasers (A), 532
 Far-infrared Cerenkov masers (A), 531
 Self-transparency effects in nonlinear light-scattering inhomogeneous media and their possible use in lasers (A), 538

Biology

- Lasers in cell biology and genetics (A), 560

Birefringence

- Measurement of the magnetic birefringence of noble gases, 635

Bismuth

- Hyperfine structure in the 6p³ 4S^o_{3/2}-6p³ 2D^o_{5/2}, 647.5-nm forbidden transition in Bi I (L), 320

Bistability

- Band-gap resonant Fabry-Perot nonlinearities and two-photon-induced optical switching in CdHgTe (A), 475
 Distinguishing chaos from noise in an optically bistable system (A), 464
 Effects of Gaussian-beam averaging on phase conjugation and beat-frequency spectroscopy, 95
 Effects of mirror reflectivity in excitonic optical bistability, 395
 Evolution of two-dimensional transverse solitary waves and solitons in an optical bistable resonator (A), 467
 Low-power optical bistability in cadmium sulfide platelets (A), 476
 Macroscopic manifestations of microscopic optical bistability (A), 466
 Magnetically induced relaxation oscillations in a sodium-filled Fabry-Perot resonator (A), 468
 Nonlinear refraction at the band gap in InAs (A), 475
 Optical bistability and differential gain resulting from absorption increasing with excitation, 857
 Optical bistability and monolithic logic functions based on bistable-laser light-emitting diodes (A), 465
 Optical bistability from increasing absorption (A), 477
 Optically bistable operation of laser by output-feedback pumping and loss-modulation schemes with first-order phase-transition analogies (A), 467
 Optical multistability in collinear degenerate four-wave mixing, 91
 Steady-state and pulse behavior of light transmitted through dispersive nonlinear media in a ring cavity, 742
 Theory and experiment on transverse intensity bistability in the transmission of a Gaussian laser beam through a nonlinear thin film (A), 477
 Transient behavior of excitonic semiconductor optical bistability (A), 476

Books reviewed

- Concepts of Quantum Optics. By P. L. Knight and L. Allen, Reviewed by Roy, Rajarshi, 761
 Electromagnetic Waves in Matter, Part 1, Volume 8 of Infrared and Millimeter Waves. Edited by Kenneth J. Button, Reviewed by Sollner, T. C. L. G., 676
 Foundations of Laser Spectroscopy. By Stig Stenholm, Reviewed by Thomas, John E., 676
 Handbook of Stochastic Methods. Volume 13 of the Springer Series in Synergetics. By C. W. Gardiner, Reviewed by Wódkiewicz, K., 409

- High Power Iodine Laser. By G. Brederlow, E. Fill, and K. J. Witte, Reviewed by Hagen, W. F., 324

- Introduction to Nonlinear Laser Spectroscopy. By Marc D. Levenson, Reviewed by Carlson, Nils W., 409
 Introduction to the Theory of Laser-Atom Interactions. By Marvin H. Mittleman, Reviewed by Mandel, Leonard, 125
 Laser Processing and Analysis of Materials. By W. W. Duley, Reviewed by Stone, J. P., 760

- Millimeter Components and Techniques, Part 1, Volume 9 of Infrared and Millimeter Waves. Edited by Kenneth J. Button, Reviewed by Sollner, T. C. L. G., 676

- Molecular Ions Geometric and Electronic Structures. Volume 90 of NATO ASI Series B in Physics. Edited by Joseph Berkowitz and Karl-Ontjes Groeneveld, Reviewed by Sears, Trevor J., 324

- Nonlinear Laser Chemistry: Multiple-Photon Excitation. Volume 22 of the Springer Series in Chemical Physics. By V. S. Letokhov, Reviewed by King, David, 411

- Physics of Thin Films. Advances in Research and Development, Volume 12. Edited by Georg Hass, Maurice H. Francombe, and John L. Vossen, Reviewed by Macleod, H. Angus, 323

- Quantum Metrology and Fundamental Constants, Volume 98 of the NATO Advanced Science Institute Series. Edited by Paul Cutler and A. A. Lucas, Reviewed by Metcalf, Harold J., 761

- Surface Polaritons: Electromagnetic Waves at Surfaces and Interfaces. Edited by V. M. Agranovich and D. L. Mills, Reviewed by Simon, H. J., 410

- Treatise on Materials Science and Technology. Volume 24 of Preparation and Properties of Thin Films. Edited by K. N. Tu and R. Rosenberg, Reviewed by Tsaur, Bor-Yeu, 410

- Vibrational Spectra and Structure, A Series of Advances, Volume 12. Edited by James R. Durig, Reviewed by Murphy, William F., 412

- Waves and Photons—An Introduction to Quantum Optics. By Edwin Goldin, Reviewed by Lieber, M., 324

Bromine

- Predicted wavelengths and transition rates for magnetic-dipole transitions within 3s²3pⁿ ground configurations of ionized Cu to Mo, 218

Cerium

- Ag I-like array 4d¹⁰5s-4d⁹5s5p of I VII through Eu XVII, 38

Cesium

- Ag I-like array 4d¹⁰5s-4d⁹5s5p of I VII through Eu XVII, 38

Chemistry

- Laser Processing and Analysis of Materials. By W. W. Duley (B), Reviewed by Stone, J. P., 760
 Nonlinear Laser Chemistry: Multiple-Photon Excitation. Volume 22 of the Springer Series in Chemical Physics.

By V. S. Letokhov (B), Reviewed by King, David, 411

Chromium

X-ray spectra of B- and Be-like chromium in the 13–15-Å region, 155

COAT (Coherent optical adaptive techniques)

See Adaptive optics

Coherence

Modeling noise by jump processes in strong laser-atom interactions, 176

Phase correlation in cascade spontaneous emission by a multilevel system: atomic memory, 879

Relaxation terms for strong-field optical Bloch equations, 751

Role of primary excitation statistics in the generation of antibunched and sub-Poisson light, 366

Squeezed states in the transient regime of resonance fluorescence, 882

Coherent anti-Stokes Raman scattering

Coherent anti-Stokes Raman spectroscopy thermometry of multiatomic gases: SF₆ (A), 486

Investigation of nitrobenzene by coherent anti-Stokes Raman spectroscopy (A), 511

Raman linewidths of hydrogen fluoride determined by using low-resolution coherent anti-Stokes Raman spectroscopy, 774

Surface enhancement of coherent anti-Stokes Raman scattering by colloidal spheres, 56

Computers

Optical computing: how far can light waves penetrate computer technology? (A), 464

Quantum-mechanical computers (A), 464

Copper

On the ground configuration of the phosphorus sequence from copper to molybdenum, 296

Predicted wavelengths and transition rates for magnetic-dipole transitions within 3s²3pⁿ ground configurations of ionized Cu to Mo, 218

Correlation

Phase correlation in cascade spontaneous emission by a multilevel system: atomic memory, 879

Crystals

High-efficiency and wide-band single-harmonic-generation properties of the new crystal β-BaB₂O₄ (A), 434

Two-wave mixing with an applied field and a moving grating, 868

Crystals, liquid

Nonlinear optical susceptibilities of binary mixtures of liquid crystals (A), 432

Third-order nonlinear optical susceptibility of conjugated liquid-crystal polymers (A), 434

Wavelength-tunable phase retardation plate (A), 516

Detection

Amplitude- and frequency-modulation Raman heterodyne detection of optical double resonance (A), 492

Raman heterodyne detection of nuclear magnetic resonance (A), 502

Detectors

See also individual types

Generation-recombination noise in extrinsic photoconductive detectors, 354

Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121

Diffraction

See also Gratings

Outline of a variational formulation of zone-plate theory, 806

Dispersion

Determination of the x-ray anomalous dispersion of titanium made with a titanium-carbon layered synthetic microstructure, 691

Effects of cavity dispersion in femtosecond mode-locked dye lasers (A), 436

Laser-controlled optics using nonlinear dispersion in gaseous media (A), 491

Negative dispersion from prisms (A), 437

Dysprosium

Application of the parametric description of the isotope shift to the lanthanides, 293

Hyperfine structure of 4f^N 6s² configurations in ¹⁵⁹Tb, ^{161,163}Dy, and ¹⁶⁹Tm, 22

J dependence of the isotope shift in the ground term of dysprosium I, 34

Electromagnetic waves

Heuristic approach to spontaneous emission factor of gain-guided lasers (L), 406

Self-oscillations of counterpropagating waves in a two-level medium (A), 498

Statistical mechanics of light-induced forces, 658

Steady-state and pulse behavior of light transmitted through dispersive nonlinear media in a ring cavity, 742

Surface Polaritons: Electromagnetic Waves at Surfaces and Interfaces. Edited by V. M. Agranovich and D. L. Mills (B), Reviewed by Simon, H. J., 410

Electro-optics

Optical instabilities in a nonlinear Kerr medium, 662

Sensitivity improvement of tone-burst modulated spectroscopy with a color-center laser, 710

Errata

Pre-Gaussian noise in strong laser-atom interactions, 759

Europium

Ag I-like array 4d¹⁰5s-4d⁹5s5p of I VII through Eu XVII, 38

Application of the parametric description of the isotope shift to the lanthanides, 293

Excitons

Transient behavior of excitonic semiconductor optical bistability (A), 476

Fabry-Perot

Magnetically induced relaxation oscillations in a sodium-filled Fabry-Perot resonator (A), 468

Observation of period-doubling to chaos in all-optical Fabry-Perot resonators (A), 488

Faraday effect

Resonant magnetic rotation of polarization directions (A), 546

Femtosecond phenomena

See also Picosecond phenomena

Compression and parametric scattering with femtosecond pulses (A), 435

Control of profile and chirp of femtosecond light pulses by propagating them through resonant and nonresonant optical media (A), 435

Degenerate four-wave mixing of femtosecond pulses in the saturable absorber of a ring dye laser (A), 435

Effects of cavity dispersion in femtosecond mode-locked dye lasers (A), 436

Femtosecond kinetics of malachite green (A), 454

Femtosecond relaxation dynamics in magnetic garnets (A), 427

Femtosecond studies of intraband relaxation in GaAs and related compounds and structures (A), 427

Fiber optics

See also specific applications

Active transmission line: light amplification by backward-stimulated Raman scattering in polarization-maintaining optical fiber, 80

Compression of optical pulses chirped by self-phase modulation in fibers, 139

Continuous-wave Raman oscillation for a Nd³⁺:YAG intracavity fiber laser, 86

Development of the stimulated Raman spectrum in single-mode silica fibers, 652

Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121

Fluorescence

Fluorescence-detected Raman-optical double-resonance spectroscopy (A), 503

Fluorescence in frequency-modulated beams: a probe of the correlation functions of atomic inversion, 865

Laser-excited fluorescence for diagnosis of cancer (A), 559

Laser-induced fluorescence line narrowing in atomic vapors, 161

Modeling noise by jump processes in strong laser-atom interactions, 176

Picosecond investigations on the fluorescence properties of adsorbed dye molecules (A), 456

Squeezed states in the transient regime of resonance fluorescence, 882

Squeezed states in transient regime of resonance fluorescence (A), 517

Study of calcium monohalide-rare-gas collisional energy transfer processes by

laser-excited-state-resolved
fluorescence spectroscopy (A), 511

Focus

Self-focusing in underdense ultraviolet
laser-produced plasmas (A), 480

Fourier transforms

Fourier-transform Raman spectroscopy of
supersonic expansions (A), 503

Four-wave mixing

See Multiphoton processes; Phase
conjugation

Collision effects on Zeeman coherences
using nearly degenerate four-wave
mixing (A), 483

Degenerate four-wave mixing in dye-
dissolving liquid crystal (A), 526

Degenerate four-wave mixing of
femtosecond pulses in the saturable
absorber of a ring dye laser (A), 435

Experimental study of squeezed states
using four-wave mixing in a cavity
configuration (A), 525

Exploration of high-order optical
susceptibilities via angularly resolved
multiwave mixing (A), 501

Four-wave mixer and parameter amplifier
cavity configurations suitable for
squeezed-state generation (A), 510

Nondegenerate four-wave mixing in InSb
using low-power continuous-wave CO
lasers (A), 500

Picosecond optical saturation and four-
wave mixing in GaAs transient
electron-hole plasma (A), 500

Quantum statistics of degenerate four-
wave mixing (A), 525

Saturation in degenerate four-wave mixing
(A), 501

Two-photon resonant optical processes in
atomic potassium (A), 530

Ultrahigh time-resolution coherent
transient spectroscopy with incoherent
or phase-modulated light (A), 526

Frequency conversion

High-energy vacuum-ultraviolet frequency
conversion (A), 522

Fresnel zone plates

See Zone plates

From the Editor

From the Editor (N), 1

Fusion

See also Lasers

Absorption physics at 351 nm in spherical
geometry (A), 469

Interaction of an incoherent laser with
planar targets (A), 470

Laser fusion in new types of targets (A),
479

Overview of research within the U.S.
inertial fusion program (A), 469

Simple model for radiation transport in
laser targets linking local
thermodynamical equilibrium and
coronal ionizations (A), 471

Gallium

Predicted wavelengths and transition rates
for magnetic-dipole transitions within
 $3s^2 3p^n$ ground configurations of
ionized Cu to Mo, 218

Gallium materials

Beam coupling in undoped GaAs at 1.06
 μm using the photorefractive effect
(A), 443

Germanium

On the ground configuration of the
phosphorus sequence from copper to
molybdenum, 296

Predicted wavelengths and transition rates
for magnetic-dipole transitions within
 $3s^2 3p^n$ ground configurations of
ionized Cu to Mo, 218

Glass

Observation of light detection by glass-
metal seals: their influence on
measurements involving discharges as
light detectors and the possibility of
optical-fiber light detectors (L), 121

Gratings

See also Diffraction

Enhanced growth of submicrometer metal
gratings (A), 474

Suppression of thermal gratings in
polarization spectroscopy (A), 549

Two-wave mixing with an applied field and
a moving grating, 868

Guided waves

Observation of intensity-dependent guided
waves (A), 509

Heterodyning

Amplitude- and frequency-modulation
Raman heterodyne detection of optical
double resonance (A), 492

Raman heterodyne detection of nuclear
magnetic resonance (A), 502

Hole burning

Beyond the bottleneck: submicrosecond
hole burning in phthalocyanine, 341

Detection of persistent spectral holes using
ultrasonic modulation, 349

Persistent spectral hole burning in CaF_2 :
 Sm^{2+} (A), 550

Holography

Two-wave mixing with an applied field and
a moving grating, 868

Hydrogen

Multiphoton resonance ionization of
neutral hydrogen atoms in electron-
stimulated desorption (A), 472

Spectroscopy of the Rydberg molecules H_3 ,
 D_3 , D_2H , and H_2D (A), 493

State-selective two-step laser spectroscopy
of the hydrogen atom and molecule
(A), 485

Image processing

Two-wave mixing with an applied field and
a moving grating, 868

Infrared

Electromagnetic Waves in Matter, Part 1,
Volume 8 of Infrared and Millimeter
Waves. Edited by Kenneth J. Button
(B), Reviewed by Sollner, T. C. L. G.,
676

Millimeter Components and Techniques,
Part 1, Volume 9 of Infrared and
Millimeter Waves. Edited by Kenneth
J. Button (B), Reviewed by Sollner, T.
C. L. G., 676

Nitric-acid band intensities and band-
model parameters from 610 to 1760
 cm^{-1} , 715

Optical pulse compression in the infrared
(A), 451

Sensitivity improvement of tone-burst
modulated spectroscopy with a color-
center laser, 710

Infrared, far

Electromagnetic Waves in Matter, Part 1,
Volume 8 of Infrared and Millimeter
Waves. Edited by Kenneth J. Button
(B), Reviewed by Sollner, T. C. L. G.,
676

Far-infrared laser magnetic resonance of
vibrationally excited CD_2 , 15

Far-infrared nonlinearities of lattice
vibrations and free carriers (A), 549

Millimeter Components and Techniques,
Part 1, Volume 9 of Infrared and
Millimeter Waves. Edited by Kenneth
J. Button (B), Reviewed by Sollner, T.
C. L. G., 676

Interferometry

See Fabry-Perot

Iodine

Ag I-like array $4d^{10}5s-4d^95s5p$ of I VII
through Eu XVII, 38

Iron

Ionization potential of neutral iron, Fe I, by
multistep laser spectroscopy, 314

Isotope separation

Atomic-vapor laser isotope separation at
Lawrence Livermore National
Laboratory (A), 552

Isotope-selective counting of krypton
atoms using resonance ionization
spectroscopy (A), 554

Photochemical enrichment of ^{196}Hg (A),
553

Isotope shifts

Isotope shift of uranium in the infrared
region between 1817 and 5598 cm^{-1} ,
788

Precision isotope shifts for the heavy
elements. III. Singly ionized thorium
(Th II), 782

Krypton

Energy-level and lifetime measurements
for Kr VII, 30

Predicted wavelengths and transition rates
for magnetic-dipole transitions within
 $3s^2 3p^n$ ground configurations of
ionized Cu to Mo, 218

Lanthanum

Ag I-like array $4d^{10}5s-4d^95s5p$ of I VII
through Eu XVII, 38

Rh I isoelectronic sequence: analysis of the
 $4d^9-4d^85p$ transition array in La XIII,
41

Laser damage

Improved laser-damage-resistant polymethyl methacrylate, 853

Lasers

See also specific types, subtopics and applications

Active transmission line: light amplification by backward-stimulated Raman scattering in polarization-maintaining optical fiber, 80

Behavior of homogeneously broadened lasers operating far above threshold (A), 440

Chaos and order in the spectral behavior of multimode lasers (A), 487

Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591

Continuous-wave Raman oscillation for a Nd³⁺:YAG intracavity fiber laser, 86

Dimensionality of dynamical chaos in an unstable single-mode laser (A), 499

Dynamics of continuous-wave NH₃ lasers as measured with a tunable diode laser (A), 439

Half-integer harmonic emission from laser plasmas as a coronal temperature diagnostic (A), 480

High-gain lasers excited by inner-shell photoionization from broadband soft-x-ray laser-produced-plasma sources (A), 429

High Power Iodine Laser. By G. Brederlow, E. Fill, and K. J. Witte (B), Reviewed by Hagen, W. F., 324

Introduction to the Theory of Laser-Atom Interactions. By Marvin H. Mittleman (B), Reviewed by Mandel, Leonard, 125

Laser cooling of trapped ions: dynamics of the final stages, 111

Laser-plasma interaction experiments at the 0.53- μ m Novette facility (A), 480

Laser Processing and Analysis of Materials. By W. W. Duley (B), Reviewed by Stone, J. P., 760

Parity violation in atoms (A), 527

Performance of a microwave clock based on a laser-induced stimulated Raman interaction (A), 528

Phase and frequency jump theory of laser band shape (A), 506

Pre-Gaussian noise in strong laser-atom interactions, 398, (errata), 759

Self-transparency effects in nonlinear light-scattering inhomogeneous media and their possible use in lasers (A), 538

Simultaneous multikilobar compressional shock-wave generation and probing using short-pulse lasers (A), 444

Tests of the optical Bloch equations for solids (A), 527

Lasers, applications

Finite interaction times and laser-bandwidth effects on the photoemission from an autoionizing atom, 641

Laser-controlled optics using nonlinear dispersion in gaseous media (A), 491

Laser-induced coherent microstructures on solid and liquid surfaces (A), 455

Laser-induced diffusion by collisional redirection and relaxation (A), 553

Laser-induced electron multiplication and optical emission in high-density gases (A), 516

Laser-induced surface ripples: recent developments (A), 455

Laser Processing and Analysis of Materials. By W. W. Duley (B), Reviewed by Stone, J. P., 760

Lasers in modern industry (A), 464

State-selective investigation of molecule-surface interaction by laser diagnostics (A), 472

Time-resolved laser-induced phase transformation in aluminum (A), 457

Lasers, carbon dioxide

High-gain recombination laser produced by CO₂ laser-vaporized target material (A), 515

Resonant heating and wavelength-dependent infrared-laser desorption from condensed layers (A), 474

Spontaneous oscillations, generalized multistability and intermittency route to chaos in a bidirectional CO₂ ring laser (A), 497

Lasers, diode

Analytic model of homogeneously broadened injection lasers: comparison of theory and experiment (A), 462

GaAlAs/GaAs surface-emitting injection laser (A), 463

Heuristic approach to spontaneous emission factor of gain-guided lasers (L), 406

Passive mode locking of semiconductor-laser diodes (A), 452

Recent developments in very-high-speed semiconductor laser diodes (A), 460

Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452

Temperature dependence of quantum-fluctuation linewidth broadening in (GaAl)As diode lasers (A), 459

Lasers, dye

Characterization of fluctuations in a synchronously mode-locked dye laser (A), 454

Degenerate four-wave mixing of femtosecond pulses in the saturable absorber of a ring dye laser (A), 435

Effects of cavity dispersion in femtosecond mode-locked dye lasers (A), 436

Efficient plastic-host dye lasers (A), 431

Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361

Single-shot spectral measurements and mode correlations in a multimode pulsed dye laser, 150

Stable two-mode operation of a continuous-wave dye laser using a Michelson mode selector (A), 438

Lasers, excimer

Picosecond gain dynamics in KrF (A), 453

Pulse compression of excimer radiation by backward-stimulated Brillouin scattering in gaseous media (A), 509

Lasers, free-electron

Classical versus quantum noise in the start-up of free-electron lasers (A), 523

Development and applications of laboratory-scale free-electron lasers (A), 530

Diagnostics of relativistic electron beams with lasers (A), 532

Effect of betatron oscillations on the three-dimensional radiation fields in a free-electron laser oscillator (A), 506

Electromagnetic instabilities in free-electron lasers (A), 506

Far-infrared Čerenkov masers (A), 531

Free-electron laser project at AT&T Bell Laboratories (A), 497

Generation of high-intensity coherent radiation in the soft-x-ray regime (A), 530

High-power operation of the Los Alamos free-electron laser oscillator (A), 505

Instability and quantum initiation in the free-electron laser (A), 523

Media free-electron lasers (A), 531

Results of the TRW/Stanford tapered-wiggler oscillator experiments (A), 497

Simplified analysis of spontaneous and stimulated emission for various free-electron laser configurations (A), 524

Storage-ring operation of free-electron lasers with phase-area displacement wiggler (A), 496

Tutorial on free-electron lasers (A), 523

Two-cavity optical klystron (A), 524

United Kingdom free-electron laser project (A), 505

Visible free-electron laser at Orsay (A), 496

Lasers, gas

New simple model for high-power pulsed gas lasers (A), 513

Lasers, high-power

New laser concept: magnetic-surface-induced spin-flip transitions (A), 432

New simple model for high-power pulsed gas lasers (A), 513

Lasers, infrared

Energy pooling pumped infrared laser emission in laser-excited sodium vapor (A), 508

Matrix-isolated CN⁻: a molecular-defect vibrational laser (A), 430

Lasers, mode-locked

Characterization of fluctuations in a synchronously mode-locked dye laser (A), 454

Effects of cavity dispersion in femtosecond mode-locked dye lasers (A), 436

Limits to pulse advance and delay in mode-locked lasers, 771

Passive mode locking of semiconductor-laser diodes (A), 452

Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452

Lasers, neodymium

Continuous-wave mode-locked Nd:phosphate glass laser (A), 437

Frequency jitter and linewidth of a single-mode monolithic Nd:YAG laser (A), 438

Improved laser-damage-resistant polymethyl methacrylate, 853

Lasers, Raman

Development of the stimulated Raman spectrum in single-mode silica fibers, 652

Synchronously pumped D₂ gas-in-glass fiber Raman laser operating at 1.56 μ m (A), 430

Lasers, ring

Degenerate four-wave mixing of femtosecond pulses in the saturable absorber of a ring dye laser (A), 435

Spontaneous oscillations, generalized multistability and intermittency route

to chaos in a bidirectional CO₂ ring laser (A), 497

Lasers, semiconductor

- Chaos in laser oscillations with delayed feedback: numerical analysis and observation using semiconductor lasers (A), 497
- Cleaved-coupled-cavity (C³) semiconductor lasers (A), 448
- Detuned loading in coupled-cavity semiconductor lasers—effect on quantum noise and dynamics (A), 510
- Dynamic linewidth of amplitude-modulated single-longitudinal-mode InGaAsP semiconductor lasers (A), 459
- Gain and gain suppression in semiconductor lasers (A), 450
- Heuristic approach to spontaneous emission factor of gain-guided lasers (L), 406
- Optical feedback in index-guided semiconductor lasers (A), 451
- Polarization noise properties of GaAlAs lasers (A), 462
- Quantum treatment of semiconductor laser noise (A), 461
- Recent developments in very-high-speed semiconductor laser diodes (A), 460
- Single-longitudinal-mode stabilization of semiconductor lasers (A), 450
- Temperature dependence of quantum-fluctuation linewidth broadening in (GaAl)As diode lasers (A), 459

Lasers, ultraviolet

- Continuously tunable sum-frequency generation involving sodium Rydberg states (A), 507

Lasers, x-ray

- Spectroscopy of x-ray lasers, 232

Layered synthetic microstructures

- Determination of the x-ray anomalous dispersion of titanium made with a titanium-carbon layered synthetic microstructure, 691

Liquid crystals

- See Crystals, liquid

Lithium

- On the ¹P° levels of Li⁺, 266

Magnetic properties

- Femtosecond relaxation dynamics in magnetic garnets (A), 427

Magneto-optics

- Measurement of the magnetic birefringence of noble gases, 635

Manganese

- Hyperfine structure and the broadening of sunspot spectral lines, 311
- Optical constants of thick Ti and Mn films in the spectral region from 6 to 20 eV, 76

Masers

- See also Lasers
- Far-infrared Čerenkov masers (A), 531

Materials

- Laser Processing and Analysis of Materials. By W. W. Duley (B), Reviewed by Stone, J. P., 760

Materials, optical

- Second-harmonic generation in bulk centrosymmetric media (A), 432

Medicine

- Cancer treatment with laser irradiation and tumor-seeking photosensitizers (A), 555
- Contrast enhancement in tumor localization using hematoporphyrin-derivative laser-induced fluorescence (A), 558
- Integral photoradiotherapy of bladder cancer (A), 556
- In vitro* and *in vivo* studies on the mechanism of porphyrin-induced photodamage of malignant cells (A), 555
- Laser-excited fluorescence for diagnosis of cancer (A), 559
- Lasers in cell biology and genetics (A), 560
- Light delivery systems and dosimetry in photodynamic therapy (A), 557
- Mechanisms of the hematoporphyrin-derivative-induced photodamage of neoplastic cells: fluorescence studies (A), 556
- Photodynamic therapy for treatment of cancer (A), 555
- Photophysical properties of Photofrin II in different solvents (A), 559
- Treatment of intraocular tumors with hematoporphyrin-derivative photoradiation therapy (A), 557
- Two-step laser photobiology: application for cancer treatment (A), 556

Metrology

- See also specific application
- Quantum Metrology and Fundamental Constants, Volume 98 of the NATO Advanced Science Institute Series. Edited by Paul Cutler and A. A. Lucas (B), Reviewed by Metcalf, Harold J., 761

Microwaves

- Electromagnetic Waves in Matter, Part 1, Volume 8 of Infrared and Millimeter Waves. Edited by Kenneth J. Button (B), Reviewed by Sollner, T. C. L. G., 676
- Millimeter Components and Techniques, Part 1, Volume 9 of Infrared and Millimeter Waves. Edited by Kenneth J. Button (B), Reviewed by Sollner, T. C. L. G., 676

Mirrors

- Effects of mirror reflectivity in excitonic optical bistability, 395
- Eigenmodes of Kerr-type phase-conjugate mirrors, 756

Modes

- Single-longitudinal-mode stabilization of semiconductor lasers (A), 450
- Single-shot spectral measurements and mode correlations in a multimode pulsed dye laser, 150

Modulation

- Amplitude- and frequency-modulation

- Raman heterodyne detection of optical double resonance (A), 492
- ND₄ Schüler-band absorption and other scientific applications of frequency-modulation spectroscopy (A), 494

Modulators

- Sensitivity improvement of tone-burst modulated spectroscopy with a color-center laser, 710

Molecules

- Coherent anti-Stokes Raman spectroscopy thermometry of multiatomic gases: SF₆ (A), 486
- Cold-jet infrared absorption spectroscopy of heavy-metal compounds (A), 552
- Determination of the H + D₂ product state distribution using a novel laser ionization mass spectrometer (A), 539
- Time-resolved Raman spectroscopy of infrared multiphoton excited molecules (A), 538

Molybdenum

- On the ground configuration of the phosphorus sequence from copper to molybdenum, 296
- Predicted wavelengths and transition rates for magnetic-dipole transitions within 3s²3pⁿ ground configurations of ionized Cu to Mo, 218

Multiphoton processes

- See also Phase conjugation
- Chaotic dynamics in infrared multiple-photon absorption (A), 542
- Discretization in the quasi-continuum, 169
- Experimental difficulty of optical squeezed-state generation (A), 525
- First reported observation of multiply charged ions of alkaline atoms by multiphoton ionization (A), 505
- Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9
- Infrared multiple-photon dissociation of chloroform-d (A), 512
- Interaction of atomic and molecular systems with high-intensity ultraviolet radiation, 3
- Line narrowing and photoelectron trapping in multiphoton ionization spectroscopy, 874
- Multiphoton excitation by adiabatic following (A), 546
- Multiphoton processes in two-level atoms in two intense pump beams, 164
- Multiphoton resonance ionization of neutral hydrogen atoms in electron-stimulated desorption (A), 472
- Nonlinear Laser Chemistry: Multiple-Photon Excitation. Volume 22 of the Springer Series in Chemical Physics. By V. S. Letokhov (B), Reviewed by King, David, 411
- Nonlinear susceptibilities of two-level systems in intense double-frequency fields (A), 515
- Photoelectron studies of excited molecular states. H₂C ¹I_u and N₂ O₃ ¹I_u (A), 495
- Relaxation terms for strong-field optical Bloch equations, 751
- Scaling rules for multiphoton interband absorption in semiconductors, 67
- Scheme for investigation of two-photon emission in sodium, 606
- Time-resolved Raman spectroscopy of infrared multiphoton excited molecules (A), 538

- Tunability of radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels, 812
- Two-mode formalism for two-photon optics (A), 524
- Two-photon electric-dipole selection rules, 52
- VUV and XUV generation with multiphoton excitation (A), 521

Neodymium

- Ag I-like array $4d^{10}5s-4d^95s5p$ of I VII through Eu XVII, 38

Niobium

- Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^23p^n$ ground configurations of ionized Cu to Mo, 218

Noise

- Limits to pulse advance and delay in mode-locked lasers, 771
- Modeling noise by jump processes in strong laser-atom interactions, 176
- Pre-Gaussian noise in strong laser-atom interactions, 398, (errata), 759

Nonlinear optics

- See also specific branch
- Angled-beam photon echoes, 189
- Beam coupling in undoped GaAs at 1.06 μm using the photorefractive effect (A), 443
- Beam propagation and optical power limiting with nonlinear media, 729
- Compression of optical pulses chirped by self-phase modulation in fibers, 139
- Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591
- Critical microemulsions as optically nonlinear media (A), 433
- Development of the stimulated Raman spectrum in single-mode silica fibers, 652
- Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9
- Global dynamics of Ikeda's plane-wave map (A), 499
- High-efficiency and wide-band single-harmonic-generation properties of the new crystal $\beta\text{-BaB}_2\text{O}_4$ (A), 434
- High-photoconductivity lithium niobate (A), 442
- Laser-controlled optics using nonlinear dispersion in gaseous media (A), 491
- Multiphoton processes in two-level atoms in two intense pump beams, 164
- Nonlinear interface behavior between glass and liquid crystal (A), 512
- Nonlinear optical susceptibilities of binary mixtures of liquid crystals (A), 432
- Nonlinear susceptibilities of two-level systems in intense double-frequency fields (A), 515
- Nonlinear ultraviolet excitation of nitriles to metastable superexcited states XCN**, indications for collisionally induced fragmentation of XCN** (A), 530
- Observation of continuous-wave on-resonance enhancement (A), 490
- Observation of self-focusing via saturable absorption in atomic Na (A), 491
- Optical bistability and differential gain resulting from absorption increasing with excitation, 857
- Optical instabilities in a nonlinear Kerr medium, 662
- Optical multistability in collinear degenerate four-wave mixing, 91
- Optical nonlinear coupling and applications to thin-film and bulk nonlinear spectroscopy (A), 458
- Optical second-harmonic generation in transmission with long-range surface plasmons (L), 317
- Phase coherent laser multiple-pulse spectroscopy (A), 545
- Picosecond optical saturation and four-wave mixing in GaAs transient electron-hole plasma (A), 500
- Polarization renormalization due to nonlinear optical generation (A), 492
- Proposal for almost noise-free optical communication under conditions of high background, 108
- Saturation and inverse-saturation absorption line shapes in alexandrite, 73
- Scaling rules for multiphoton interband absorption in semiconductors, 67
- Scheme for investigation of two-photon emission in sodium, 606
- Self-transparency effects in nonlinear light-scattering inhomogeneous media and their possible use in lasers (A), 538
- Spectral broadening of picosecond pulses in a nonlinear medium (A), 443
- Steady-state and pulse behavior of light transmitted through dispersive nonlinear media in a ring cavity, 742
- Stimulated Raman scattering of colored chaotic light, 671
- Study of DABCO as a possible two-photon laser—population dynamics and absorption spectrum of the excited \bar{A} state (A), 545
- Subnatural linewidth laser spectroscopy (A), 537
- Third-order nonlinear optical susceptibility of conjugated liquid-crystal polymers (A), 434
- Time-resolved spectroscopy of vibrational overtones and two-phonon states (A), 442
- Tunable resonant enhancement in nonlinear optical-frequency mixing (A), 522
- Two-wave mixing with an applied field and a moving grating, 868

Optical bistability

- See Bistability

Optical communications

- Proposal for almost noise-free optical communication under conditions of high background, 108

Optical computers

- Optical computing: how far can light waves penetrate computer technology? (A), 464

Optical constants

- Measurement of the magnetic birefringence of noble gases, 635
- Optical constants of thick Ti and Mn films in the spectral region from 6 to 20 eV, 76
- Surface roughness as a physical cause of the dip in the results of a Kramers-Kronig analysis of Zn_3P_2 , 850

Optical devices

- Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121

Optical materials

- Critical microemulsions as optically nonlinear media (A), 433

Optical processing

- See also Image processing

Optical properties

- Optical constants of thick Ti and Mn films in the spectral region from 6 to 20 eV, 76

Optoacoustics

- See Photoacoustics

Optoelectronics

- Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121
- Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452

Optogalvanic effects

- Direct evidence of heating and cooling in the optogalvanic-effect energy balance (A), 514
- Isotopic analysis by optogalvanic spectroscopy, 704
- Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121
- Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361

Phase conjugation

- See also Four-wave mixing, Nonlinear optics, and Multiphoton processes
- Applications of the Brillouin mirror for the control of high-power lasers (A), 534
- Effects of Gaussian-beam averaging on phase conjugation and beat-frequency spectroscopy, 95
- Eigenmodes of Kerr-type phase-conjugate mirrors, 756
- Optical multistability in collinear degenerate four-wave mixing, 91
- Optical phase conjugation near resonance with biexciton two-photon absorption in CuCl (A), 533
- Optical phase conjugation with surface plasma waves (A), 458
- Phase conjugation with the use of transverse optical pumping (A), 532
- Self-starting self-pumped multicolor passive-phase conjugation (A), 532
- Use of phase conjugation for physical measurement (A), 532

Phonons

- Time-resolved spectroscopy of vibrational overtones and two-phonon states (A), 442

Photoacoustics

- Laser photoacoustic spectroscopy and detection of intramolecular vibrational energy redistribution and unimolecular reaction processes (A), 541

Photochemical and photophysical dynamics

Beyond the bottleneck: submicrosecond hole burning in phthalocyanine, 341

Photodetectors

Generation-recombination noise in extrinsic photoconductive detectors, 354

Observation of light detection by glass-metal seals: their influence on measurements involving discharges as light detectors and the possibility of optical-fiber light detectors (L), 121

Photography

Low-energy x-ray response of photographic films. I. Mathematical models, 818

Low-energy x-ray response of photographic films. II. Experimental characterization, 828

Photoionization

High-gain lasers excited by inner-shell photoionization from broadband soft-x-ray laser-produced-plasma sources (A), 429

Photon counting

Proposal for almost noise-free optical communication under conditions of high background, 108

Role of primary excitation statistics in the generation of antibunched and sub-Poisson light, 366

Photon echoes

Angled-beam photon echoes, 189

Shape locking of photon echoes (A), 506

Stimulated photon echo for elastic and depolarizing collision studies (A), 484

Photons

Sub-Poissonian photon statistics and squeezed quantum states (A), 517

Waves and Photons—An Introduction to Quantum Optics. By Edwin Goldin (B), Reviewed by Lieber, M., 324

Photorefraction

Beam coupling in undoped GaAs at 1.06 μm using the photorefractive effect (A), 443

Two-wave mixing with an applied field and a moving grating, 868

Physics

Handbook of Stochastic Methods. Volume 13 of the Springer Series in Synergetics. By C. W. Gardiner (B), Reviewed by Wódkiewicz, K., 409

Introduction to the Theory of Laser-Atom Interactions. By Marvin H. Mittleman (B), Reviewed by Mandel, Leonard, 125

Quantum Metrology and Fundamental Constants, Volume 98 of the NATO Advanced Science Institute Series. Edited by Paul Cutler and A. A. Lucas (B), Reviewed by Metcalf, Harold J., 761

Picosecond phenomena

See also Femtosecond phenomena

Characterization of fluctuations in a synchronously mode-locked dye laser (A), 454

Limits to pulse advance and delay in mode-locked lasers, 771

Photoemission studies of surfaces using picosecond pulses of coherent extreme-ultraviolet radiation (A), 529

Picosecond gain dynamics in KrF (A), 453

Picosecond investigations on the fluorescence properties of adsorbed dye molecules (A), 456

Picosecond measurements on halorhodopsin of halobacterium halobium (A), 429

Picosecond optical collisions (A), 483

Protein-protein intermolecular singlet energy transfer: the use of picosecond spectroscopy for the analysis of light-induced protein motions of retinal rod cells (A), 429

Small-area pulse propagation on the picosecond time scale (A), 538

Spectral broadening of picosecond pulses in a nonlinear medium (A), 443

Ultrafast saturation recovery in GaInAsP (A), 428

Plasmas

Half-integer harmonic emission from laser plasmas as a coronal temperature diagnostic (A), 480

High-gain lasers excited by inner-shell photoionization from broadband soft-x-ray laser-produced-plasma sources (A), 429

High-gain recombination laser produced by CO₂ laser-vaporized target material (A), 515

Laser-plasma interaction experiments at the 0.53- μm Novette facility (A), 480

Optical phase conjugation with surface plasma waves (A), 458

Picosecond optical saturation and four-wave mixing in GaAs transient electron-hole plasma (A), 500

Progress of laser-plasma interaction research (A), 469

Self-focusing in underdense ultraviolet laser-produced plasmas (A), 480

Simple model for radiation transport in laser targets linking local thermodynamical equilibrium and coronal ionizations (A), 471

X-ray spectra of B- and Be-like chromium in the 13–15- \AA region, 155

Polarization

Polarization noise properties of GaAlAs lasers (A), 462

Polarization renormalization due to nonlinear optical generation (A), 492

Radiation torque on a sphere illuminated with circularly polarized light (A), 528

Suppression of thermal gratings in polarization spectroscopy (A), 549

Wavelength-tunable phase retardation plate (A), 516

Pollution

Laser Processing and Analysis of Materials. By W. W. Duley (B), Reviewed by Stone, J. P., 760

Potassium

Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9

Two-photon resonant optical processes in atomic potassium (A), 530

Praseodymium

Ag I-like array $4d^{10}5s-4d^95s5p$ of I VII through Eu XVII, 38

Prisms

Negative dispersion from prisms (A), 437

Propagation

Beam propagation and optical power limiting with nonlinear media, 729

Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591

Pulse compression

Compression of optical pulses chirped by self-phase modulation in fibers, 139

Optical pulse compression in the infrared (A), 451

Theory of the soliton laser (A), 445

The soliton laser (A), 444

Pulses

Compression and parametric scattering with femtosecond pulses (A), 435

Control of profile and chirp of femtosecond light pulses by propagating them through resonant and nonresonant optical media (A), 435

Limits to pulse advance and delay in mode-locked lasers, 771

Passive mode locking of semiconductor-laser diodes (A), 452

Simultaneous multikilobar compressional shock-wave generation and probing using short-pulse lasers (A), 444

Small-area pulse propagation on the picosecond time scale (A), 538

Steady-state and pulse behavior of light transmitted through dispersive nonlinear media in a ring cavity, 742

Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452

Pumping

See also Lasers

Influence of optical factors on the relaxation signal of an optically pumped vapor, 586

Quantum electronics

See also Lasers

Quantum electronics—where we have been and where we may go (A), 464

Quantum optics

Bell's inequalities in quantum optics (A), 547

Concepts of Quantum Optics. By P. L. Knight and L. Allen (B), Reviewed by Roy, Rajarshi, 761

Discretization in the quasi-continuum, 169

Fluorescence in frequency-modulated beams: a probe of the correlation functions of atomic inversion, 865

Interaction Hamiltonian of quantum optics, 116

Master equation and quantum Langevin theory of input, output, and internal modes of linear and nonlinear quantum amplifiers (A), 548

Multiphoton processes in two-level atoms in two intense pump beams, 164

Quantum fluctuations in two-color superfluorescence from three-level systems (A), 547

Quantum phase fluctuations and squeezing in degenerate four-wave mixing, 390

Quantum theory of Stokes pulse energy fluctuations (A), 547
 Relaxation terms for strong-field optical Bloch equations, 751
 Role of primary excitation statistics in the generation of antibunched and sub-Poisson light, 366
 Single-shot spectral measurements and mode correlations in a multimode pulsed dye laser, 150
 Squeezed states in the transient regime of resonance fluorescence, 882
 Stimulated Raman scattering of colored chaotic light, 671
 Waves and Photons—An Introduction to Quantum Optics. By Edwin Goldin (B), Reviewed by Lieber, M., 324

Quantum theory

Basic properties of quantum wells (A), 542
 Discretization in the quasi-continuum (A), 539
 GaAlAs/GaAs quantum-well lasers by metalorganic chemical-vapor deposition (A), 542
 Optical transition in quantum wells: valence band mixing, confined and extended excitons (A), 535
 Output characteristics of lead telluride quantum-well diode lasers (A), 544
 Picosecond relaxation of hot carriers in GaAs/AlGaAs multiple-quantum-well structures under high excitations (A), 536
 Quantum noise and the detection of squeezed states (A), 517
 Squeezed quantum fluctuations in free-motion and harmonic oscillation (A), 517
 Then and now—history and recent developments in superlattice quantum-well structures (A), 535

Radiation

Radiation torque on a sphere illuminated with circularly polarized light (A), 528
 Statistical mechanics of light-induced forces, 658

Raman effect

See also Coherent anti-Stokes Raman scattering; Scattering, Raman; Spectroscopy, molecular; Spectroscopy, Raman; and Surface-enhanced Raman spectroscopy
 Amplitude- and frequency-modulation Raman heterodyne detection of optical double resonance (A), 492
 Performance of a microwave clock based on a laser-induced stimulated Raman interaction (A), 528
 Raman heterodyne detection of nuclear magnetic resonance (A), 502

Relativity

Measurement of Fresnel drag in moving media using a ring-resonator technique (A), 528

Resonators

Evolution of two-dimensional transverse solitary waves and solitons in an optical bistable resonator (A), 467
 Light-pressure stabilization of optical resonators (A), 441
 Magnetically induced relaxation oscillations in a sodium-filled Fabry-Perot resonator (A), 468

Measurement of Fresnel drag in moving media using a ring-resonator technique (A), 528
 Observation of period-doubling to chaos in all-optical Fabry-Perot resonators (A), 488
 Optical chaos due to a competition between multiple oscillations (A), 487
 Physical interpretation of the route to chaos in nonlinear resonators (A), 489

Rubidium

Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218
 Spectrum and energy levels of eight-times ionized rubidium (Rb IX), 631

Samarium

Ag I-like array $4d^{10} 5s-4d^9 5s 5p$ of I VII through Eu XVII, 38
 Application of the parametric description of the isotope shift to the lanthanides, 293

Scattering

Laser cooling of trapped ions: dynamics of the final stages, 111
 Self-transparency effects in nonlinear light-scattering inhomogeneous media and their possible use in lasers (A), 538
 Stimulated Rayleigh-Brillouin gain spectroscopy in pure gases and gas mixtures (A), 546
 Time-resolved and state-selective study of vibrationally excited molecules scattering from surfaces (A), 471

Scattering, Brillouin

Brillouin-scattering determination of vibrational relaxation in dichloromethane, 779
 Progress of laser-plasma interaction research (A), 469
 Pulse compression of excimer radiation by backward-stimulated Brillouin scattering in gaseous media (A), 509

Scattering, Raman

Active transmission line: light amplification by backward-stimulated Raman scattering in polarization-maintaining optical fiber, 80
 Continuous-wave Raman oscillation for a Nd^{3+} :YAG intracavity fiber laser, 86
 Development of the stimulated Raman spectrum in single-mode silica fibers, 652
 Induced solitons in stimulated Raman scattering (A), 445
 Surface enhancement of coherent anti-Stokes Raman scattering by colloidal spheres, 56
 Tunability of radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels, 812
 Tunable radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels (A), 529

Scattering, stimulated Raman

Stimulated Raman scattering of colored chaotic light, 671

Second-harmonic generation

Interferometric enhancement of surface-generated second-harmonic radiation (A), 447

Optical second-harmonic generation in transmission with long-range surface plasmons (L), 317
 Progress of laser-plasma interaction research (A), 469
 Second-harmonic generation from thin-film silver electrodes via surface plasmons (A), 446
 Second-harmonic generation in bulk centrosymmetric media (A), 432
 Study of the structural arrangement of xanthene molecular adsorbates at interfaces by optical second-harmonic generation (A), 447

Selenium

Extended analyses of Se VII and Se VIII, 271
 On the ground configuration of the phosphorus sequence from copper to molybdenum, 296
 Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218

Self-focusing

Continuous-wave off-resonance rings and continuous-wave on-resonance enhancement, 591
 Observation of self-focusing via saturable absorption in atomic Na (A), 491

Semiconductors

Dual metal-insulator-semiconductor junction phototransistor (A), 508
 Physics of laser annealing of semiconductors (A), 446
 Scaling rules for multiphoton interband absorption in semiconductors, 67
 Two-photon spectroscopy of GaAs (A), 548

Sensors

See Detectors

SERS

See Surface-enhanced Raman scattering

Silica

Development of the stimulated Raman spectrum in single-mode silica fibers, 652

Sodium

Energy pooling pumped infrared laser emission in laser-excited sodium vapor (A), 508
 Observation of self-focusing via saturable absorption in atomic Na (A), 491
 Scheme for investigation of two-photon emission in sodium, 606
 Stopping neutral atoms using laser light (A), 504

Solids

Optical nonlinear coupling and applications to thin-film and bulk nonlinear spectroscopy (A), 458
 Time-resolved laser-induced phase transformation in aluminum (A), 457

Solitons

Evolution of two-dimensional transverse solitary waves and solitons in an optical bistable resonator (A), 467

- Induced solitons in stimulated Raman scattering (A), 445
 Theory of the soliton laser (A), 445
 The soliton laser (A), 444
- Sources**
- Chaotic sequence and a simple model of return map in a driven nonlinear oscillator using a light-emitting diode (A), 488
- Spectrometers**
- Determination of the H + D₂ product state distribution using a novel laser ionization mass spectrometer (A), 539
- Spectroscopy**
- See also specific branch and element
- Discretization in the quasi-continuum (A), 539
- Effects of Gaussian-beam averaging on phase conjugation and beat-frequency spectroscopy, 95
- Far-infrared nonlinearities of lattice vibrations and free carriers (A), 549
- Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9
- Hyperfine structure of $4f^N 6s^2$ configurations in ¹⁵⁹Tb, ^{161,163}Dy, and ¹⁶⁹Tm, 22
- Low-energy x-ray response of photographic films. I. Mathematical models, 818
- Optically induced homogeneous line narrowing (A), 550
- Photoexcitation of a quasi-continuum: connections to few-level dynamics, 737
- Study of calcium monohalide-rare-gas collisional energy transfer processes by laser-excited-state-resolved fluorescence spectroscopy (A), 511
- Suppression of thermal gratings in polarization spectroscopy (A), 549
- Two-photon spectroscopy of GaAs (A), 548
- Spectroscopy, atomic**
- See also individual elements
- $3d^8 4s$, $3d^8 4p$, and $3p^5 3d^{10}$ configurations in the As VII spectrum, 279
- $4s^2 \ ^1S_0 - 4s 4p \ ^1P_1$ transitions in zinlike ions, 649
- Ag I-like array $4d^{10} 5s - 4d^9 5s 5p$ of I VII through Eu XVII, 38
- Application of the parametric description of the isotope shift to the lanthanides, 293
- Atomic inner-shell transitions, 224
- Classification in the early 1980's of the spectra of highly ionized atoms, 195
- Complete set of orthogonal scalar operators for the configuration f^3 , 261
- Degenerate self-induced transparency on magnetic-dipole transitions with applications (A), 515
- Discrete $4d$ photoabsorption spectrum of Ba²⁺, 626
- Double-resonance effects in strong-field autoionization, 102
- Eighth spectrum of antimony: Sb VIII. Revised ^{2D} interval: Sb VII, 795
- Energy-level and lifetime measurements for Kr VII, 30
- Extended analyses of Se VII and Se VIII, 271
- Feature issue on the symposium on atomic spectroscopy (N), 137
- Finite interaction times and laser-bandwidth effects on the photoemission from an autoionizing atom, 641
- First reported observation of multiply charged ions of alkaline atoms by multiphoton ionization (A), 505
- Fluorescence in frequency-modulated beams: a probe of the correlation functions of atomic inversion, 865
- High-spatial-resolution spectroscopic technique for measuring hyperfine structure of atoms and molecules (A), 512
- Hyperfine structure and the broadening of sunspot spectral lines, 311
- Hyperfine structure in the $6p^3 \ ^4S^{\circ}_{3/4} - 6p^3 \ ^2D^{\circ}_{5/2}$, 647.5-nm forbidden transition in Bi I (L), 320
- Hyperfine structure intensity measurements as a tool for quadrupole radial integral determination, 48
- Ionization potential of neutral iron, Fe I, by multistep laser spectroscopy, 314
- Isotope shift of uranium in the infrared region between 1817 and 5598 cm⁻¹, 788
- Isotopic analysis by optogalvanic spectroscopy, 704
- J* dependence of the isotope shift in the ground term of dysprosium I, 34
- Laser-induced autoionization studies in xenon (A), 519
- Laser-induced fluorescence line narrowing in atomic vapors, 161
- Multichannel-quantum-defect theory wave functions of Ba tested or improved by laser measurements, 239
- On the ground configuration of the phosphorus sequence from copper to molybdenum, 296
- On the ^{1P^o} levels of Li⁺, 266
- Orthogonalized operators for the *f* shell, 255
- Oscillator strengths for neutral atomic uranium, 300
- Parametric model for *f*-shell configurations. I. The effective-operator Hamiltonian, 246
- Picosecond optical collisions (A), 483
- Precision isotope shifts for the heavy elements. III. Singly ionized thorium (Th II), 782
- Precision positronium spectroscopy (A), 504
- Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218
- Quantum superposition state scattering in ytterbium (A), 482
- Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361
- Rh I isoelectronic sequence: analysis of the $4d^9 - 4d^8 5p$ transition array in La XIII, 41
- Rydberg atoms and radiation in cavities—quantum and collective effects (A), 518
- Scheme for investigation of two-photon emission in sodium, 606
- Spectrometer-sensitivity calibration in the extreme ultraviolet by means of branching ratios of magnetic-dipole lines, 699
- Spectroscopy of heavy elements in stars, 307
- Spectrum and energy levels of eight-times ionized rubidium (Rb IX), 631
- Spontaneous quantum collapse and revival (A), 520
- Spontaneous vacuum line splitting in a cavity (A), 518
- State-selective two-step laser spectroscopy of the hydrogen atom and molecule (A), 485
- Stimulated photon echo for elastic and depolarizing collision studies (A), 484
- Stopping neutral atoms using laser light (A), 504
- Thermionic ring diode for high-resolution spectroscopy for Rydberg states (A), 519
- Two-photon electric-dipole selection rules, 52
- Uranium five (U V), the ^{1S₀} level, and a parametric analysis of the $5f^2$ configuration, 45
- Wavelengths and energy levels of doubly ionized uranium (U III) obtained using a Fourier-transform spectrometer, 609
- X-ray spectra of B- and Be-like chromium in the 13–15-Å region, 155
- Spectroscopy, Brillouin gain**
- Stimulated Rayleigh-Brillouin gain spectroscopy in pure gases and gas mixtures (A), 546
- Spectroscopy, Fourier**
- Fourier-transform Raman spectroscopy of supersonic expansions (A), 503
- Wavelengths and energy levels of doubly ionized uranium (U III) obtained using a Fourier-transform spectrometer, 609
- Spectroscopy, high-resolution**
- High-spatial-resolution spectroscopic technique for measuring hyperfine structure of atoms and molecules (A), 512
- Hyperfine structure intensity measurements as a tool for quadrupole radial integral determination, 48
- Laser cooling of trapped ions: dynamics of the final stages, 111
- Laser-induced fluorescence line narrowing in atomic vapors, 161
- Laser-microwave double-resonance experiments for high-resolution spectroscopy of radicals (A), 495
- Saturation and inverse-saturation absorption line shapes in alexandrite, 73
- Stopping neutral atoms using laser light (A), 504
- Spectroscopy, infrared**
- See also Spectroscopy, molecular
- Infrared-laser spectroscopy of ammonia-copper adsorbates by infrared-laser-induced photodesorption under ultrahigh vacuum (A), 473
- Spectroscopy, laser**
- Detection of persistent spectral holes using ultrasonic modulation, 349
- Foundations of Laser Spectroscopy. By Stig Stenholm (B), Reviewed by Thomas, John E., 676
- Frequency-modulation polarization-spectroscopy detection of persistent spectral holes, 571
- Infrared-laser spectroscopy of ammonia-copper adsorbates by infrared-laser-induced photodesorption under ultrahigh vacuum (A), 473
- Introduction to Nonlinear Laser Spectroscopy. By Marc D. Levenson (B), Reviewed by Carlson, Nils W., 409
- Ionization potential of neutral iron, Fe I, by multistep laser spectroscopy, 314
- Isotopic analysis by optogalvanic spectroscopy, 704
- Laser-induced fluorescence line narrowing in atomic vapors, 161
- Laser photoacoustic spectroscopy and detection of intramolecular vibrational

- energy redistribution and unimolecular reaction processes (A), 541
- Modeling noise by jump processes in strong laser-atom interactions, 176
- Multichannel-quantum-defect theory wave functions of Ba tested or improved by laser measurements, 239
- Multiphoton processes in two-level atoms in two intense pump beams, 164
- Photoexcitation of a quasi-continuum: connections to few-level dynamics, 737
- Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361
- Relaxation terms for strong-field optical Bloch equations, 751
- Sensitivity improvement of tone-burst modulated spectroscopy with a color-center laser, 710
- State-selective two-step laser spectroscopy of the hydrogen atom and molecule (A), 485
- Subnatural linewidth laser spectroscopy (A), 537
- ^{235}U II hyperfine structures measured by collinear fast-beam-laser and radio-frequency-laser double-resonance spectroscopy, 284

Spectroscopy, molecular

- See also Spectroscopy, infrared
- Far-infrared laser magnetic resonance of vibrationally excited CD_2 , 15
- Fluorescence-detected Raman-optical double-resonance spectroscopy (A), 503
- High-spatial-resolution spectroscopic technique for measuring hyperfine structure of atoms and molecules (A), 512
- Laser-microwave double-resonance experiments for high-resolution spectroscopy of radicals (A), 495
- Molecular Ions Geometric and Electronic Structures. Volume 90 of NATO ASI Series B in Physics. Edited by Joseph Berkowitz and Karl-Ontjes Groeneveld (B), Reviewed by Sears, Trevor J., 324
- ND_4 Schuler-band absorption and other scientific applications of frequency-modulation spectroscopy (A), 494
- Nitric-acid band intensities and band-model parameters from 610 to 1760 cm^{-1} , 715
- Photoelectron studies of excited molecular states. $\text{H}_2\text{C}^+ \text{II}_u$ and $\text{N}_2 \text{O}_3^+ \text{II}_u$ (A), 495
- Spectroscopy of the Rydberg molecules H_3 , D_3 , D_2H , and H_2D (A), 493
- State-selective two-step laser spectroscopy of the hydrogen atom and molecule (A), 485
- Vibrational Spectra and Structure, A Series of Advances, Volume 12. Edited by James R. Durig (B), Reviewed by Murphy, William F., 412

Spectroscopy, photoacoustic

See Photoacoustics

Spectroscopy, Raman

- See also Coherent anti-Stokes Raman scattering; Raman effect; Scattering, Raman; Surface-enhanced Raman spectroscopy
- Fluorescence-detected Raman-optical double-resonance spectroscopy (A), 503
- Fourier-transform Raman spectroscopy of supersonic expansions (A), 503

- Line narrowing by transient coherent Raman spectroscopy with tunable picosecond excitation (A), 537
- Measurement of the third-order susceptibility by phase-modulated nonlinear Raman spectroscopy (A), 545
- Stimulated Rayleigh-Brillouin gain spectroscopy in pure gases and gas mixtures (A), 546
- Surface enhancement of coherent anti-Stokes Raman scattering by colloidal spheres, 56
- Time-resolved Raman spectroscopy of infrared multiphoton excited molecules (A), 538
- Vibrational Spectra and Structure, A Series of Advances, Volume 12. Edited by James R. Durig (B), Reviewed by Murphy, William F., 412

Spectroscopy, ultraviolet

- $4s^2 \text{ } ^1\text{S}_0\text{-}4s4p \text{ } ^1\text{P}_1$ transitions in zinlike ions, 649
- Ag 1-like array $4d^{10}5s\text{-}4d^95s5p$ of I VII through Eu XVII, 38
- Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^23p^n$ ground configurations of ionized Cu to Mo, 218
- Rh I isoelectronic sequence: analysis of the $4d^9\text{-}4d^85p$ transition array in La XIII, 41
- Spectrum and energy levels of eight-times ionized rubidium (Rb IX), 631

Spectroscopy, x-ray

- Atomic inner-shell transitions, 224
- Low-energy x-ray response of photographic films. II. Experimental characterization, 828
- Progress of laser-plasma interaction research (A), 469
- X-ray spectra of B- and Be-like chromium in the 13-15-Å region, 155
- X-ray spectroscopic studies of exploding foils (A), 481

Standards

- Quantum Metrology and Fundamental Constants, Volume 98 of the NATO Advanced Science Institute Series. Edited by Paul Cutler and A. A. Lucas (B), Reviewed by Metcalf, Harold J., 761
- Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361

Statistical optics

- See also Coherence and Photon counting
- Statistical mechanics of light-induced forces, 658

Strontium

- Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^23p^n$ ground configurations of ionized Cu to Mo, 218

Submillimeter waves

- Electromagnetic Waves in Matter, Part 1, Volume 8 of Infrared and Millimeter Waves. Edited by Kenneth J. Button (B), Reviewed by Sollner, T. C. L. G., 676
- Millimeter Components and Techniques, Part 1, Volume 9 of Infrared and Millimeter Waves. Edited by Kenneth

J. Button (B), Reviewed by Sollner, T. C. L. G., 676

Surface-enhanced Raman scattering

- Surface enhancement of coherent anti-Stokes Raman scattering by colloidal spheres, 56

Surface plasmons

- Optical second-harmonic generation in transmission with long-range surface plasmons (L), 317
- Second-harmonic generation from thin-film silver electrodes via surface plasmons (A), 446

Surfaces

- Enhanced growth of submicrometer metal gratings (A), 474
- Experimental study of nonlinear interface between glass and liquid crystal (A), 457
- Infrared-laser spectroscopy of ammonia-copper adsorbates by infrared-laser-induced photodesorption under ultrahigh vacuum (A), 473
- Interferometric enhancement of surface-generated second-harmonic radiation (A), 447
- Laser-induced coherent microstructures on solid and liquid surfaces (A), 455
- Laser-induced surface ripples: recent developments (A), 455
- Nonlinear interface behavior between glass and liquid crystal (A), 512
- Photoemission studies of surfaces using picosecond pulses of coherent extreme-ultraviolet radiation (A), 529
- Resonant heating and wavelength-dependent infrared-laser desorption from condensed layers (A), 474
- State-selective investigation of molecule-surface interaction by laser diagnostics (A), 472
- Studies of atomic and molecular adsorption on surfaces in ultrahigh vacuum (A), 446
- Study of the structural arrangement of xanthene molecular adsorbates at interfaces by optical second-harmonic generation (A), 447
- Surface roughness as a physical cause of the dip in the results of a Kramers-Kronig analysis of Zn_3P_2 , 850
- Time-resolved and state-selective study of vibrationally excited molecules scattering from surfaces (A), 471

Surface waves

- Optical phase conjugation with surface plasma waves (A), 458
- Optical second-harmonic generation in transmission with long-range surface plasmons (L), 317
- Surface Polaritons: Electromagnetic Waves at Surfaces and Interfaces. Edited by V. M. Agranovich and D. L. Mills (B), Reviewed by Simon, H. J., 410

Switches

- Synchronous mode locking of a GaAs/GaAlAs laser diode by a picosecond optoelectronic switch (A), 452

Synchrotron radiation

- Probing atomic and molecular processes with synchrotron radiation (A), 521

Temperature

Coherent anti-Stokes Raman spectroscopy thermometry of multiatomic gases: SF₆ (A), 486

Terbium

Hyperfine structure of $4f^N 6s^2$ configurations in ¹⁵⁹Tb, ^{161,163}Dy, and ¹⁶⁹Tm, 22

Thin films

Optical nonlinear coupling and applications to thin-film and bulk nonlinear spectroscopy (A), 458
 Physics of Thin Films. Advances in Research and Development, Volume 12. Edited by Georg Hass, Maurice H. Francombe, and John L. Vossen (B), Reviewed by Macleod, H. Angus, 323
 Second-harmonic generation from thin-film silver electrodes via surface plasmons (A), 446
 Theory and experiment on transverse intensity bistability in the transmission of a Gaussian laser beam through a nonlinear thin film (A), 477
 Treatise on Materials Science and Technology. Volume 24 of Preparation and Properties of Thin Films. Edited by K. N. Tu and R. Rosenberg (B), Reviewed by Tsaur, Bor-Yeu, 410

Thorium

Precision isotope shifts for the heavy elements. III. Singly ionized thorium (Th II), 782
 Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361

Thulium

Hyperfine structure of $4f^N 6s^2$ configurations in ¹⁵⁹Tb, ^{161,163}Dy, and ¹⁶⁹Tm, 22

Titanium

Determination of the x-ray anomalous dispersion of titanium made with a titanium-carbon layered synthetic microstructure, 691
 Optical constants of thick Ti and Mn films in the spectral region from 6 to 20 eV, 76

Transmission

Transmission anomalies of aluminum foil irradiated by intensive laser-produced x-ray radiation (A), 481

Ultrafast phenomena

See Femtosecond phenomena and Picosecond phenomena
 Limits to pulse advance and delay in mode-locked lasers, 771

Ultraviolet

Generation of coherent UV radiation by optical wave-mixing processes in atomic potassium, 9

Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218
 Self-focusing in underdense ultraviolet laser-produced plasmas (A), 480
 Ultraviolet excitation of cryogenic rare-gas-fluorine solutions (A), 551

Ultraviolet, extreme

Continuously tunable sum-frequency generation involving sodium Rydberg states (A), 507
 Interaction of atomic and molecular systems with high-intensity ultraviolet radiation, 3
 Photoemission studies of surfaces using picosecond pulses of coherent extreme-ultraviolet radiation (A), 529
 Tunability of radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels, 812
 Tunable radiation generated at wavelengths below 1 Å by anti-Stokes scattering from nuclear levels (A), 529
 VUV and XUV generation with multiphoton excitation (A), 521

Ultraviolet, vacuum

$3d^8 4s$, $3d^8 4p$, and $3p^5 3d^{10}$ configurations in the As VII spectrum, 279
 $4s^2 1S_0-4s4p 1P_1$ transitions in zinlike ions, 649
 High-energy vacuum-ultraviolet frequency conversion (A), 522
 Nonlinear ultraviolet excitation of nitriles to metastable superexcited states XCN**, indications for collisionally induced fragmentation of XCN** (A), 530
 Probing atomic and molecular processes with synchrotron radiation (A), 521
 Spectrometer-sensitivity calibration in the extreme ultraviolet by means of branching ratios of magnetic-dipole lines, 699
 Spectrum and energy levels of eight-times ionized rubidium (Rb IX), 631
 Tunable resonant enhancement in nonlinear optical-frequency mixing (A), 522
 VUV and XUV generation with multiphoton excitation (A), 521

Uranium

Isotope shift of uranium in the infrared region between 1817 and 5598 cm⁻¹, 788
 Isotopic analysis by optogalvanic spectroscopy, 704
 Oscillator strengths for neutral atomic uranium, 300
 Reference lines for dye-laser wave-number calibration in the optogalvanic spectra of uranium and thorium, 361
²³⁵U II hyperfine structures measured by collinear fast-beam-laser and radio-frequency-laser double-resonance spectroscopy, 284
 Uranium five (U V), the ¹S₀ level, and a parametric analysis of the $5f^2$ configuration, 45
 Wavelengths and energy levels of doubly ionized uranium (U III) obtained using a Fourier-transform spectrometer, 609

Vision

Protein-protein intermolecular singlet energy transfer: the use of picosecond spectroscopy for the analysis of light-induced protein motions of retinal rod cells (A), 429

Xenon

Ag I-like array $4d^{10} 5s-4d^9 5s 5p$ of I VII through Eu XVII, 38
 Laser-induced autoionization studies in xenon (A), 519

X-rays

Determination of the x-ray anomalous dispersion of titanium made with a titanium-carbon layered synthetic microstructure, 691
 Low-energy x-ray response of photographic films. I. Mathematical models, 818
 Low-energy x-ray response of photographic films. II. Experimental characterization, 828
 Transmission anomalies of aluminum foil irradiated by intensive laser-produced x-ray radiation (A), 481

Ytterbium

Quantum superposition state scattering in ytterbium (A), 482
 Stimulated photon echo for elastic and depolarizing collision studies (A), 484

Yttrium

Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218

Zeeman effect

Collision effects on Zeeman coherences using nearly degenerate four-wave mixing (A), 483

Zinc

$4s^2 1S_0-4s4p 1P_1$ transitions in zinlike ions, 649
 Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218

Zirconium

On the ground configuration of the phosphorus sequence from copper to molybdenum, 296
 Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^n$ ground configurations of ionized Cu to Mo, 218

Zone plates

Outline of a variational formulation of zone-plate theory, 806