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- 427 **Optical Implementation of One-Rule Pattern Symbolic Substitution**
G. Li, L. Liu (China)
- 429 **Optoelectric Hybrid Processor Array System**
Y. M. Zhang, W. Y. Liu, G. Zhou, D. J. Sun, H. Q. Li (China)
- 432 **Lens Codification in Pixelated Spatial Light Modulators**
E. Carcolé, J. Campos, S. Bosch, J. R. de F. Moneo (Spain)

- 434 **Optical Computing of a Wigner Distribution Function Using a Liquid Crystal Light Valve and the Real-Time Phase Profiling Method**
T. Iwai, N. Kawamura, T. Takemori, T. Kubo (Japan)
- 436 **Optical Data Self-Routing System**
P. Chavel, P. Koppa, J. L. Oudar, R. Kuszelewicz, J. P. Schnell, J. Raffy, J. P. Pocholle, M. Papuchon (France)
- 438 **Mathematical Problems in Spectroscopic Information Processing**
C. Li, B. Zhao (China)
- 440 **Optoelectronic Cellular Two-Layer Logic Image Processor**
L. Liu, Z. Zhang, X. Zhang (China)
- 442 **Optical Digital Implementation of Wavelet Transform: Application to Image Variant Filtering**
P. Artal, C. Gonzalo (Spain)
- 444 **Metal Surface Texture Monitoring by Digital Image Processing**
R. Silvennoinen, K.-E. Peiponen, J. Räsänen, C. Gu (Finland); T. Asakura (Japan); E. J. Morley (Norway)
- 446 **Cellular Fuzzy-Logic Array and Optical Implementation**
L. Liu (China)
- 448 **Iterative Recursive Image Reconstruction from the Bispectrum**
H. Weghorn (FRG)
- 450 **Investigations of the Stellar Disk of Alpha Orionis at Visible Wavelengths**
H. Weghorn (FRG)
- 452 **Spectroscopic Classification of a Color Image by Subspace Method**
S. Toyooka, N. Hayasaka (Japan); T. Jaaskelainen (Finland)
- 454 **Amplitude-Encoded Binary Phase-only Filter with Low Resolution**
K. Styczinski, K. Chalasinska-Macukow (Poland)

OPTICAL STORAGE AND MEMORY

- 458 **Applications and Mechanisms of Optical Data Storage in Filled Nematics**
M. Kreuzer, T. Tschudi (FRG)
- 460 **Testing of Phase-Change (PC) Optical Disk for Common Specifications**
T. Kubo, T. Sugaya, I. Satoh, J. Ohtsubo, T. Iwai (Japan)
- 462 **Laser Recording on Light-Sensitive Chalcogenide Glass Multilayer Films**
A. Kikineshi, A. Mishak, A. Sterr, V. Tsigika (Ukraine)
- 464 **Formation of Optical Disk Direction Paths and Optical Master Disks with the Help of Inorganic Resist**
I. Z. Indutnyi, S. A. Kostioukevitch, A. V. Stronski, P. E. Schepeljavi, L. T. Gladchenko (Ukraine)

NEURAL NETWORKS

- 468 **Optical Neural Networks with Random Interconnections by Cheap Ground Glass**
H.-J. Lee, S.-Y. Lee, S.-Y. Shin (Korea)
- 470 **Neural Networks: Recognition Based on Differences**
J. Mandziuk, B. Macukow (Poland)
- 472 **Neural Algorithms in Digital Halftoning**
T. Tuttass, O. Bryngdahl (FRG)
- 474 **Neural Network Interconnection Capacity of Synthetic Multifacet Holograms**
E. Tervonen, J. Turunen, J. Westerholm (Finland)
- 476 **New Architecture for All-Optical Neural Network Computing**
Y. Hayasaki, I. Tohyama, T. Yatagai, M. Mori, S. Ishihara (Japan)

OPTICAL INTERCONNECTIONS

- 480 **Optical Switching (Invited Lecture)**
K. J. Blow, J. K. Lucek, K. Smith (UK)
- 485 **Fundamental Limit in the Detection of Angular Modulation in Coherent Optical Communications**
F. J. Mendieta, A. Arvizu, M. Corona (USA)
- 487 **Suppression of Stimulated Brillouin Scattering by Temperature Distribution in Polarization Maintaining Fibers**
Y. Imai, N. Shimada (Japan)
- 489 **Demonstration of an Optoelectronic Switching Network**
E. Gluch, H. Kobolla, K. Zürl, N. Streibl, J. Schwider (FRG)
- 491 **Application of Spatial Light Modulators in Optical Interconnections**
H. Ichikawa, J. Turunen, J. F. Snowdon, M. R. Taghizadeh, N. McArdle (UK)
- 493 **Dataflow Computing Based on Optical Array Logic**
M. Iwata, J. Tanida, Y. Ichioka (Japan)
- 495 **Programmable Optoelectronic Hybrid Interconnection Network**
Y. M. Zhang, G. Zhou, W. Y. Liu, X. Q. He, H. Q. Li (China)
- 497 **Multiple Splitting of Laser Beam Using Surface-Relief Holographic Diffraction Element**
I. Aubrecht, M. Miler (Czech Republic)
- 499 **Optoelectronic Board-to-Board Interconnection with High-Packing Density Using a Light-Guiding Plate Supplied with Grating Couplers and Field Lenses**
R. Völkel, N. Streibl, H. Kobolla, J. Schmidt, J. Schwider, F. Zobel (FRG)
- 501 **Demonstration of an Optoelectronic Bus-Type Interconnection Network**
U. Danzer, J. Drescher, M. Schwab, J. Schwider, K. Zürl (FRG)

- 503 **Copying Computer-Generated Holographic Interconnectors**
A. Fimia, R. Fuentes, I. Pascual, J. J. Egozcue, M. T. Navarro (Spain)
- 505 **Multistage Free-Space Optical Interconnection Networks for 2D Images Using Polarization-Based Switches**
V. B. Fyodorov (Russia)
- PHYSICAL OPTICS**
- 508 **Geometric Phase in Optics: Observations at the Classical and Quantum Limits (Invited Lecture)**
P. Hariharan, M. Roy, P. A. Robinson, J. W. O'Byrne (Australia)
- 513 **Spatial Characterization of Partially Coherent Beams (Invited Lecture)**
R. Martinez-Herrero (Spain)
- 519 **Global Noninvariance of the Spectrum of Light on Propagation**
E. Wolf (USA)
- 520 **Radiative Polaritons in Structure: ATR Prism–Vacuum Gap–Semiconductor Film–Metal Surface**
E. A. Vinogradov (Russia)
- 522 **Entropy in Polarization Optics**
C. Brosseau (France)
- 524 **Diffraction of Ultrashort Pulses from a Grating**
Zs. Bor, A. P. Kovács (Hungary)
- 526 **Extended Confinement Beam Generation**
E. Marom, N. Konforti, D. Mendlovic (Israel); J. Katz (USA)
- 528 **Coherent Beam Profile Shaping by Means of Diffraction Gratings**
E. Balashova, A. Katolik, M. Neofitnyi (Ukraine)
- 530 **Surface Plasmon Mean-Free-Path Study of Noble Metal Surfaces in the Visible and Near Infrared**
N. Kroó, Z. Szentirmay (Hungary); W. Krieger, J. P. Thost (FRG)
- 532 **Optical Magnus Effect in a Few Modes Fiber**
N. D. Kundikova, B. Ya. Zel'dovich (Russia)
- 533 **Edge and Line Detection: Interpretation Using the Conrady Criterion**
M. L. Calvo, M. Chevalier (Spain); V. Lakshminarayanan (USA)

Part Two

HOLOGRAPHY

- 536 **Real-Time Computer-Generated 3-D Holograms (Invited Lecture)**
S. A. Benton, P. St.-Hilaire, M. Lucente, J. D. Sutter, W. J. Plesniak (USA)
- 544 **Omnidirectional Holography**
P. Greguss, T. Balogh (Hungary)

- 550 **Synthetic Bragg Holograms**
J. Turunen (Finland); P. Blair, J. M. Miller, M. R. Taghizadeh (UK); E. Noponen (Finland)
- 552 **Image Reconstruction from the Transverse and Longitudinal Spatial Coherence Function of Scattered Radiation**
A. M. Zarubin (FRG)
- 554 **Spectral Holography and Application in Fast Optical Signal Processing**
Y. T. Mazurenko (Russia)
- 556 **Computer-Generated Holography: a Simple 1D Version**
A. W. Lohmann (FRG); A. Serrano-Heredia, V. Arrizon, J. Ojeda-Castaneda (Mexico)
- 558 **Narrow Band Width Interference Filter with Photorefractive LiNbO₃**
R. Müller, L. Arizmendi, J. M. Cabrera (Spain)
- 560 **A *Posteriori* Phase-Shifting Holographic Interferometry**
A. M. Zarubin, X.-Y. Su, G. von Bally (FRG)
- 562 **New Exact Methods of the Treatment of the Effects of Nonlinear Recording in Holography**
I. Bányász (Hungary)
- 564 **Comparative Study of the Diffraction Efficiency and Scattering of Bleached Holograms Recorded with an Nd:YAG Pulsed Laser at 532 nm**
S. Kumar, K. Singh (India)
- 566 **Space-Frequency Band of Steady Hologram Recorded by Phase-Locked Method**
G. V. Chaptsova, I. V. Goltser, N. D. Kundikova, I. I. Naumova (Russia)
- 568 **Holographic Massively Parallel Array Illuminator for Operation in the Near Infrared**
H. C. Zhai (China); P. Chavel, I. Seyd-Darwish, J. Taboury (France)
- 570 **Modulation Analysis Phase-Shifting Fringe Pattern and Its Application to Evaluation of Holographic Interferograms**
X.-Y. Su, A. M. Zarubin, G. von Bally (FRG)
- 572 **New Approach to Image Reconstruction from Referenceless Holograms**
R. N. Besaha, I. I. Mokhun, V. V. Yatsenko (Ukraine)
- 574 **Referenceless Hologram as a Matched Filter**
R. N. Besaha, I. I. Mokhun, V. V. Yatsenko (Ukraine)
- 576 **Digital Holographic Contouring**
J. Pomarico, R. Arizaga, R. Torroba, H. Rabal (Argentina)
- 578 **Cascades of Dichromated Gelatin Holograms for 1.5- μ m Wavelength**
H. Kobolla, W. Frie, J. Schmidt, E. Gluch, J. Schwider (FRG)
- 580 **Jigsaw Puzzle Holography: Image Pseudocoloring**
E. Tepichín, P. Rodríguez, J. G. Suárez, G. Ramírez (Mexico)
- 582 **Determination of Slope and Curvature in Object Deformation with Computer-Generated Holograms**
L. Wang, T. Tschudi (FRG)

- 583 **Pseudoscopic Imaging by Means of a Holographic Screen**
J. J. Lunazzi (Brazil)
- 585 **Real-Time Holographic Interferometry with BTO**
J. Dubielzig, A. Kießling, L. Wenke (FRG)
- 587 **Digital Holographic Display of Light-in-Flight**
H. Rabal, J. Pomarico, R. Arizaga (Argentina)
- 589 **Recording of Cultural Assets by Color Holography**
T. Kubota (Japan)
- 591 **Simultaneous Absorption and Phase Gratings Recording in Photorefractive $\text{Bi}_{12}\text{TiO}_{20}$ crystals**
A. A. Kamshilin (Finland)
- 593 **Chalcogenide Layers as Holographic Media**
I. I. Robur, P. F. Romanenko, A. V. Stronski, L. I. Kostrova, P. E. Schepeljavi, S. A. Kostioukevitch (Ukraine)

GRATINGS

- 596 **Antireflection Properties of Crossed Gratings**
R. Bräuer, O. Bryngdahl (FRG)
- 598 **Linear Diffraction Gratings Generated by Point Sources**
Z. S. Hegedûs (Australia); K.-I. Hibino (Japan)
- 600 **Rigorous Three-Dimensional Analysis of Volume and/or Surface-Relief Holographic Grating Diffraction**
B. C. Chernov (Russia)
- 602 **Selective Properties of Gratings**
A. Sentenac, J.-J. Greffet (France)
- 604 **Brewster's Law Modification for Dielectric with Periodically Corrugated Reflecting Surface**
Yu. A. Avetisyan (Russia)
- 606 **Design of Multilevel Dammann Gratings**
H. Lüpken, F. Wyrowski, O. Bryngdahl (FRG)
- 608 **Anomalous Behavior of Reflecting Diffraction Gratings for TE and TM Polarizations**
S. A. Ledesma, C. C. Lemmi (Italy); V. L. Brudny, R. A. Depine (Argentina)
- 610 **Matrix Eigenvalue Method for Anisotropic Dielectric Gratings**
J. Yamakita, K. Matsumoto, K. Rokushima (Japan)
- 612 **Determination of the Wire Profile of Highly Conducting Wire Gratings Using an Electromagnetic Theory of Diffraction**
H. Lochbihler (FRG); R. A. Depine (Argentina)
- 614 **Influence of Photoelastic Constant Values on the Characteristics of Light Diffracted by Holographic Gratings in Cubic Photorefractive Piezocrystals**
V. V. Shepelevich (Republic of Belarus)

DIFFRACTION

- 618 **Fundamental Theorem of Diffraction Tomography**
E. Wolf (USA)
- 620 **Comparison of Exact and Approximate Solutions for Focusing of Two-Dimensional Electromagnetic Waves**
H. A. Eide, J. J. Stamnes (Norway)
- 622 **Simple Extension of Babinet's Principle to Weak Phase Objects**
M. Totzeck, M. A. Krumbügel (FRG)
- 624 **Twisted Gaussian Schell-Model Beams: Interpretation and Experiments**
A. T. Friberg, E. Tervonen, J. Turunen (Finland)
- 626 **Gaussian Beams in Fourier Optics**
E. Stijns, S. Roose (Belgium)
- 628 **Variable Achromatic Fresnel Diffraction Pattern**
J. Lancis, V. Climent, P. Andrés (Spain); E. Tepichin (Mexico)
- 630 **Exact Solutions for Focusing of 2D Electromagnetic Waves**
J. J. Stamnes (Norway)
- 632 **Nearfield Threshold Criteria for Structure Determination of Weak Phase Objects**
M. A. Krumbügel, M. Totzeck (FRG)
- 634 **Representation of Huygens's Principle for Wave Optical Computing**
P. Enders (FRG)
- 636 **Super-Gaussian Beams of Continuous Order: Wave Propagation**
G. Saavedra, E. López-Olazagasti, A. Serrano-Heredia, J. Ojeda-Castaneda (Mexico)
- 638 **Scaling Properties of Fresnel Diffraction Field by Regular Fractals**
Y. Sakurada, J. Uozumi, T. Asakura (Japan)

DIFFRACTIVE OPTICS

- 642 **Diffraction Optics for X Rays (Invited Lecture)**
A.G. Michette (UK)
- 647 **Diffraction Optical Elements for Laser Processing**
L. L. Doskolovich, M. A. Golub, N.L. Kazanskiy, V. A. Soifer, G. V. Uspleneyev (Russia)
- 649 **Iterative Correction of Holographic Lenses**
O. Falkenstörfer, T. Keinonen, N. Lindlein, J. Schwider, N. Streibl (FRG)
- 651 **Diffraction Optical Filters for Image Processing Systems**
P. Ehbets, M. Stalder, H. P. Herzig (Switzerland)
- 653 **Computer-Generated Optical Elements for Application in Optical Measuring Devices**
T. Tschudi, K. Gerstner, J. Hossfeld, L. Wang (FRG)

- 654 **Application of Diffraction Gratings in Laser Doppler Velocimetry (LDV)**
J. Czarske, F. Hock, H. Müller (FRG)
- 656 **Diffraction Investigation of Focusators into Plane Area**
L. L. Doskolovich, M. A. Golub, N. L. Kazanskiy, S. I. Kharitonov, V. A. Soifer (Russia)
- 658 **Collimating Laser Diodes with Hybrid Optics**
C. Haupt, E. Jäger, A. Rothe, M. Daffner, H. J. Tiziani (FRG)
- 660 **Binary Artificial Index Deflection Elements**
H. Haidner, P. Kipfer, J. T. Sheridan, J. Schwider, N. Streibl, M. Collischon, A. Lang (FRG)
- 662 **Diffraction Optical Elements for Miniaturized Laser Doppler Velocimetry Systems**
J. Schmidt, R. Völkel, W. Stork, J. Schwider, N. Streibl (FRG)
- 664 **Ultrahigh-Carrier Synthetic Diffractive Elements: Electromagnetic Theory**
E. Noponen, J. Turunen (Finland)
- 666 **Diffractive Optical Elements for the Infrared**
H. Haidner, P. Kipfer, J. T. Sheridan, J. Schwider, W. Stork, N. Streibl, M. Collischon (FRG)
- 668 **Fabrication of Diffractive Optical Elements by Laser-Lithography**
T. Dresel, S. Frank, U. Krackhardt, M. Schrader, J. Schwider, N. Streibl, A. Wehrhahn (FRG)
- 670 **Design and Manufacturing of Holographic Optical Elements in Optical Disk Systems**
J. P. H. Benschop, H. Steinhauser (The Netherlands)
- 672 **Sizable Diffractive Lenses for X-ray Applications by Spatial-Frequency Multiplication**
G. I. Greisukh, S. A. Stepanov (Russia)
- 674 **Application of Vitreous Chalcogenides in Diffractive Optics**
A. V. Stronski, P. F. Romanenko, I. I. Robur, I. Z. Indutnyi, P. E. Schepeľjavi (Ukraine)

INTERFEROMETRY AND ITS APPLICATIONS

- 678 **Polarization Sensitive Nonconventional Interferometers**
C. M. Gómez, E. Tepichin, G. Ramírez, J. Ibarra (Mexico); J. Ojeda-Castañeda (Spain)
- 680 **Comparison of Holographic and Electronic Speckle Pattern Interferometers**
Z. Füzessy, J. Kornis (Hungary)
- 682 **Ultrawideband Optical Heterodyne Interferometer**
S. Yokoyama, T. Araki, N. Suzuki (Japan)
- 684 **Refractive Index as a Function of Wavelength Through Spectrally Resolved White-Light Interferometry**
C. Sáinz, J. Calatroni, P. Jourdan, R. Escalona, A. L. Guerrero (Venezuela)
- 686 **Analysis of Complex Interferograms on Personal Computers**
M. Kálal (Czech Republic)
- 688 **Fringe Spacing Measurements Using a Discrete Autocorrelation Algorithm**
J. Pomarico, R. Arizaga, R. Torroba, H. Rabal (Argentina)

- 690 **Analysis of Low-Coherence Excitation of Two-Mode Fiber in Michelson Interferometer Configuration**
P. Hlubina (Czech Republic)
- 692 **Two-Wavelength Heterodyne Absolute-Ranging Technique Using Suppressed Carrier Modulation**
E. Fischer, E. Dalhoff, T. Ittner, S. Kreuz, H. J. Tiziani (FRG)
- 694 **Digital Visibility Measurements by Fourier Analysis**
J. Pomarico, R. Torroba (Argentina)
- 696 **Laser-Diode Fizeau Interference Microscopy with a Phase-Shifting Technique: Error Analysis**
Y. Ishii, J. Chen, T. Nakamura (Japan)
- 698 **Laser-Diode Heterodyne Interferometry with a Self-Pumped Phase-Conjugate Mirror**
Y. Ishii, I. Uehira (Japan)
- 700 **Phase-Shifting Techniques in an Interferometer with an Externally Pumped Phase-Conjugate Mirror**
S. Ludwig, B. Fleck, L. Wenke (FRG)
- 702 **Imaging Characteristics of Prism Interferometers**
G. Spur, L. Nyarsik, K. Körner (FRG)
- 704 **Modifications of Known Types of Interferometers for Angular Measurements**
A. A. Arefiev, R. O. Kanashkin, Yu. P. Zdorkin, A. A. Ivanov (Russia)
- 706 **Method of Eliminating the Measurement Error for Phase-Shifting Interferometry**
C. Liu, J. Chen, Z. Li (China)
- 708 **Evaluating Shearing Interferograms Using Optimization Techniques**
S. M. Bäumer, J. Kross (FRG)
- 710 **New Approach for Interferogram Analysis Based on Optimization Methods**
F. Guse, J. Kross (FRG)
- 712 **Multiple-Beam Interferometry by Using Near-Grazing Reflection**
J. Pedraza-Contreras, G. Rodríguez-Zurita, A. Cornejo-Rodríguez, O. Cardona-Nuñez (Mexico)
- 714 **New Compensating Four-Phase Algorithm for Phase-Shifting Interferometry**
J. Schwider, O. Falkenstörfer, H. Schreiber, A. Zöllner, N. Streibl (FRG)
- 716 **Phase Unwrapping in Phase-Shifting Interferometry**
H. Schreiber, O. Falkenstörfer, J. Schwider, A. Zöllner (FRG)
- 718 **Real-time Speckle Displacement Measurement Employing SLM-Based Phase Correlator**
C. Gorecki (France)
- 720 **Moiré Shearing Interferometry and Mirror Surface Translation Method for Measurement of Derivatives**
L. Wang, T. Tschudi (FRG)
- 722 **Optical Methods for Interferogram Processing**
A. Manolova, I. D. Nikolov (Bulgaria)

- 724 **Moire Interferometry with Pseudorandom Screens**
J. Campos, J. Ibarra, A. Landa, J. Ojeda-Castañeda (Mexico)
- 726 **Phase Shifting with Roof Prisms: an Application in Interferometry**
G. Ruiz-Soto, R. Diaz-Urbe (Mexico)
- 728 **Spatiotemporal Birefringence Measurements in an Antiferroelectric Liquid Crystal Cell by Polarization Interferometry**
K. Oka, J. Ikeda, Y. Ohtsuka (Japan)
- 730 **Controlled Diagnostic Interferometer with Laser Diode**
A. V. Kudryashov, A. V. Seliverstov (Russia)
- 732 **Heterodyne Interferometer with an EO Modulator**
D.-C. Su, L.-H. Shyu, C.-L. Chen, C.-D. Chen, M.-H. Chiu (Taiwan)
- 734 **DSPI Multiple-Viewpoint Technique**
H. Rabal, R. Arizaga, M. Trivi (Argentina)
- 736 **Compact Phase-Shifting Interferometer for Optical Shop Testing**
A. Vogel (FRG); H.-J. Heimbeck (Switzerland)
- 737 **Two-Frequency Laser Interferometer for Position Measurement**
A. Kiss, Z. Füzeszy, P. Pacher (Hungary)
- 739 **Common Path Heterodyne Interferometer with a Modified Lens**
W. Jia, L. Xiang (China)
- 741 **Holographic Interferometer for Measuring Temperature Distributions in D₂O in a Cold Fusion Device**
S. Himeno, M. Seki, Y. Hamamoto (Japan)

LASER MATERIAL PROCESSING

- 744 **Optics for Laser Material Processing**
J. Fontaine, T. Engel, P.-A. Vetter, M. Kane (France)
- 746 **Transmission Properties of All-Silica Fibers for Material Processing**
N. Reng, T. Beck (FRG)
- 748 **Ultrafast Photography of Shock Waves Originating from a UV Photoablated Surface**
Zs. Bor, B. Hopp, Zs. Márton, Z. Gogolák, F. Ignácz (Hungary)
- 751 **Laser Micromachining Projection Microscope**
K. Osvay, Z. Bor, B. Rácz (Hungary); J. Heitz (Austria); I. N. Ross (UK)
- 753 **Formation of Submicron Diffused Layers by Laser and Flashlamp Irradiation**
R. Chander (India); A. Chankin (Russia); A. Dhaul (India); Ya. Fattakhov, I. Khaibullin, N. Kisina, G. Mikhailova, A. Seferov, V. Zotov (Russia)
- 755 **Radial Variable Reflectance Mirrors at 10.6 μ m**
R. V. Medianu, C. A. Timus (Romania)

- 757 **Deep Ti Implantation by Multipulse Ruby Laser Irradiation of a LiNbO₃ Single Crystal with Ti Deposit: Implantation Performances, Numerical Analysis, and Optical Characteristics of Implanted Structures**
M. Bertolotti, A. Ferrari, G. Maiello, L. Schirone (Italy); G. N. Mikhailova, S. S. Seferov (Russia); N. Chitica, M. Dinescu, I. N. Mihailescu, C. Vasilescu (Romania)
- 759 **Final Status of a Metal Sample Surface after Multipulse Laser Irradiation in an Ambient Gas**
C. Boulmer-Leborgne, J. Hermann, B. Dubreuil (France); M. Dinescu, N. Chitica, I. N. Mihailescu (Romania)
- 761 **Beam Characterization of a High-Power Laser Using the Dominant Mode**
St. Amarande, V. G. Velculescu (Romania)

OPTICAL METROLOGY

- 764 **Simple Graphical Method for Single-Layer Ellipsometry Data Analysis**
S. Bosch, J. Campos (Spain)
- 766 **Temperature Dependence of the Thermo-Optic Coefficients of Quartz Retardation Plates**
G. Carbonara, S. De Nicola, A. Finizio, G. Pierattini (Italy)
- 768 **Large Area Polarization Device**
I. V. Goltser, M. Ya. Darsht, N. D. Kundikova, B. Ya. Zel'dovich (Russia)
- 769 **Application of Raman Spectroscopy for Investigation of Solid Solutions of II-VI Semiconductors**
V. M. Skobeeva, V. V. Serdyuk (Ukraine)
- 771 **Interaction of Spatial and Polarization Degrees of Freedom of Light in Multimode Optical Fibers: Experiment and Theory**
N. D. Kundikova, V. S. Liberman, B. Ya. Zel'dovich (Russia)
- 773 **Configurational Relaxation of van der Waal Complexes (VWC) in Solution**
N. A. Nemkovich, A. N. Rubinov, Yu. V. Zvinevich (Republic of Belarus)
- 775 **Optical Density Reduction Effect of Activated Porous Glass Due to Formation Dye Molecule Fractal Clusters**
V. N. Beger, T. D. Kolesnikova, A. V. Sechkarev (Russia)
- 777 **Multichannel Acousto-Optic Spectrometer**
D. R. Pape, J. A. Carter (USA)
- 779 **Sensitivity of the Optical Polarization Measurements in Squeezed Light**
I. V. Sokolov, Ya. A. Fofanov (Russia)
- 781 **Applications of Cholesteric Mirrors to the Study of Electro-Optic Effects in Liquid Crystals**
B. Kerlleñevich, A. Coche (France)

MATERIALS FOR LINEAR AND NONLINEAR OPTICS

- 784 **Optical Frequency Conversion in Organic and Inorganic Crystals and Thin Films (Invited Lecture)**
P. Günter (Switzerland)

- 785 **Photorefractive Nonlinear Optics and Applications (Invited Lecture)**
J.-P. Huignard, H. Rajbenbach (France)
- 798 **Erase Rate in Photorefractive KNbO_3 Induced by Laser Pulses**
K. Kamra, N. Birla, K. Singh (India)
- 800 **Optical Quality Investigations of Urea Crystals**
N. P. Zaitseva, S. V. Bogatyreva, I. L. Smolsky (Russia)
- 802 **Noncoherent Phase Conjugation in Photorefractive $\text{Bi}_{12}\text{TiO}_{20}$**
M. P. Petrov, E. V. Mokrushina, A. V. Toropov (Russia); E. Mendes, D. Tentori (Mexico)
- 804 **Optical/Electronic Processes in Photorefractive Sillenite Crystals Based on Multilayer Structures**
I. Zakharov, E. A. Spirin, V. Oumrikhin (Russia)
- 806 **Nonexponential Sinusoidal Grating Decay in the Photorefractive $\text{Bi}_{12}\text{TiO}_{20}$ in $\lambda = 0.633 \mu\text{m}$**
G. Nader, A. A. Tagliaferri, P. Acioly M. dos Santos (Brazil)
- 808 **Resonant Amplification in Thin Metallic Grating Deposited onto Nonlinear Materials**
M. Leyva Lucero, R. Garcia Llamas, J. M. Siqueiros, L. E. Regalado (Mexico)
- 810 **Orientation-Dependent Cross- and Parallel-Polarization Coupling in Compound Semiconductor PR Crystals: DFWM in Transmission Geometry**
A. Roy, K. Singh (India)
- 812 **Real-Time Edge Enhancement Using Fanning Process in a Nonlinear Photorefractive BaTiO_3 Crystal**
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OPAKFI Scientific Society for Optics, Acoustics, and Filmtechnics

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OSA Optical Society of America
EOS European Optical Society
OMFB The Hungarian National Committee for Technological Development
IUPAP The International Union of Pure and Applied Physics

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PRESIDENT'S MESSAGE

On behalf of the International Commission for Optics, I warmly welcome your participation in ICO-16: Optics as a Key to High Technology.

This conference is the most important event in ICO's calendar. It is organized every three years by a Territorial Committee in Optics, on behalf of ICO. Previous meetings were held in Quebec, Canada, and Garmisch-Partenkirchen, Germany, and now it is the turn of Budapest, Hungary. More than 440 contributed papers and 30 invited talks will be presented at ICO-16. Perhaps more significant, the authors of these papers come from more than 40 territories, making ICO-16 *the* international optics event of the year.

During ICO-16, ICO will hold its triennial business meeting, and I hope we shall be voting to add several new territories to the present 37 who are already members of ICO. We shall also elect a new Bureau who will run ICO's affairs during the next three years.

As I am sure you realize, the organization of an international conference of this nature depends considerably on the volunteer effort of many individuals. A list of the various committees that have helped to organize the meeting is given elsewhere in this program. I would particularly like to thank the Chair of the Organizing Committee, Dr. Gábor Lupkovics, and the Chair of the Program Committee, Professor Norbert Kroó, who have devoted a considerable portion of their time over the past two years to this meeting.

I hope everyone attending ICO-16 will enjoy the scientific sessions and take this opportunity to renew old friendships and start new ones. I hope too that you will take some time off to explore this magnificent city of Budapest.

J. C. Dainty
President 1990-1993
ICO

WELCOME ADDRESS

It is my great pleasure to welcome all the participants and guests of the 16th World Congress of the International Commission for Optics.

We feel honored whenever a prestigious scientific event like this conference is hosted by our beloved city of Budapest. In fact, we are particularly honored in this case, since we believe our city, with its large intellectual community and long tradition in science and industry, is predestined to be a center for high technology industry. Although the development of such industry was not promoted by previous administrations, our new administration places a high priority on attracting investment in high technology industry. Such investment will provide local employment and enhance the competitiveness of our industrial economy with those of other developed countries. Optics is, of course, one of the high technology fields we are looking at.

I hope that your International Congress will be a success and will be useful for all of you. Furthermore, I hope that you will enjoy our city and that you will feel welcome here. Finally, I wish to thank all the decision makers who brought the conference here to Budapest, and the organizers who have worked to make the conference a success.

Dr. Gábor Demszky
Mayor of Budapest

PREFACE

It is my great pleasure, following the ICO sponsorship of two previously organized Hungarian scientific conferences in 1980, that Hungary is host to scientists, researchers, and interested students from five continents for the 16th Congress of the International Commission for Optics.

Our topic this year, "Optics as a Key to High Technology," well reflects the tendency toward very fast development of the optical sciences, namely, the quick use of results and the important role of optics in the progress of universal technical and scientific development. This activity, underlined and supported by ICO, is also exemplified by the fact that people from 55 countries will take part in the conference and presentations from 42 countries have been submitted. In addition 31 invited lecturers will be giving overviews on the newest results in their scientific fields.

Our Congress occurs between two satellite meetings that deal with two additional topics: active and adaptive optics, which have grown into an independent branch of science, and the very important topic of education in optics. This is also a novelty in the history of the ICO Congress.

On behalf of the ICO-16 I would like to express my gratitude to the ICO Bureau for making the organization in Budapest possible, as well as to the members of the Scientific, Advisory, and Organizing Committees for their very high quality work, which did so much to ensure that this congress will meet professional expectations.

Thanks are due to several domestic and international organizations that made possible the support of scientists from the developing countries. Finally I would like to welcome all participants in the name of ICO and OPAKFI and I hope that besides the very important scientific information exchange, Budapest should remain as a lasting impression in their memories.

Gabor Lupkovics
Vice-President ICO
ICO-16 Congress Chairman