

About the Authors



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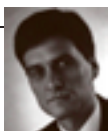
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Chapter C.12

Andreas Assion joined Femtolasers in January of 2005. Prior to joining Femtolasers, he worked with ultrafast lasers on the observation and control of quantum optical phenomena in atoms and molecules. He earned his diploma and doctorate studying molecular dynamical effects, including coherent control of complex molecules. After a post-doctoral position with the German Space Agency, he completed his Habilitation 2004.

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Thomas Bauer is a physicist working at Jenoptik Polymer Systems GmbH (former WAHL optoparts) as head of coating department. His main areas of interest are plastic optics in general and coating of plastic optics in particular.

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Chapter C.12

Professor Baumert received his Ph.D. with Prof. Gerber, University of Freiburg, Germany in 1992. Further positions in his career were: 1992–1993, post doc with Prof. Zewail, Caltech, Pasadena; 1993–1997, “Habilitation”, University of Würzburg, Germany; 1998–1999, head of LIDAR group, DLR Oberpfaffenhofen, Germany; 1999 Full Professor of Experimental Physics at University of Kassel, Germany. His research area: Femtosecond spectroscopy and ultrafast laser control of matter. Awards: Gödecke thesis award (1992), Heisenberg-Scholarship of DFG (1997–1998), Philip-Morris-Award (2000).

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Chapter C.10

Prior to joining the CTO office at Philips Lighting as technical officer solid-state lighting, Dietrich Bertram headed a project on LED light sources at Philips Research. His background education is physics, where he obtained a masters degree at Marburg University in epitaxy of III-V materials and a Ph.D. from the Max-Planck Institute of Solid State Research, Stuttgart, Germany.

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Klaus Bonrad studied chemistry in Darmstadt and received his Ph.D. in Mainz at the Max-Planck-Institute of Polymer Research for synthesis and characterisation of electrooptical macrocycles. After a post-doc position at Virginia Polytechnic Institute and State University in Blacksburg/USA he worked for IBM and SCHOTT Spezialglas AG in the field of organic light emitting diodes developing large area displays in Mainz.

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Matthias Born is a physicist and joined Philips Research Aachen, Germany, in 1992. He is leading several projects about plasma physics and diagnostics of gas discharges with a major topic on mercury-free lamps for general and automotive lighting applications. He is also working as a professor for physics at the Heinrich-Heine-University of Düsseldorf.

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Annette Borsutzky studied physics in Bielefeld and Hannover, Germany, where she received in 1992 her Dr. rer. nat. working on nonlinear frequency mixing in crystals and gases. Joining the university of Kaiserslautern studies of optical parametric oscillators, diode-pumped solid state lasers as well as the characterization of new nonlinear and laser active materials are at the center of her work.

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Hans Brand received the degrees Dipl.-Ing. in 1956, Dr.-Ing in 1962 and Dr.-Ing. habil. in 1962 at the RWTH Aachen, Germany. In 1969 he became professor at the Chair for Microwave Engineering at the FAU Erlangen, Germany. His main fields of research are microwaves, millimeter wave and terahertz components and systems as well as gas laser and infrared laser technology. In 1996 he became Fellow of the IEEE. He is emeritus since 1998.

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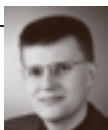
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Chapter B.7

Robert P. Breault is the Chairman and founder of the Breault Research Organization. He works on stray light analysis and suppression. He is the author of the APART stray light analysis program, used to analyze the Hubble telescope and many others. He received the B.S. in mathematics from Yale University, and his M.S. and Ph.D. in optical sciences from the University of Arizona. He is a fellow of SPIE and founder and Co-chairman of the Arizona Optics Industry Association.

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Dr. Brinkmann is a professor of optical engineering at the University of Applied Sciences Darmstadt, Germany. He obtained his Ph.D. degree in Physics from the Ruhr-Universität Bochum, Germany in 1997 for his work on high-temperature superconductors. Prior to joining the University of Applied Sciences Darmstadt, he worked as a staff scientist and research manager at Schott Glas corporate research in Mainz, Germany. His main scientific focus covered thermal material properties of glass and microstructured optical glass for photonic applications. His current research activities include integrated waveguide optics and diffractive microoptics for various Photonic applications.

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Uwe Brinkmann obtained his education in physics at the universities Munich, Heidelberg, Hannover, and worked in laser research at the Universität Cologne before joining Lambda Physik, Göttingen, as Head of Research and Development. Since 1988 self-employed, he edited the German periodical Laser und Optoelektronik over 20 years and is a contributing editor to Laser Focus World since 1987.

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Robert Brunner graduated from the University of Ulm in 1994 and received his Ph.D. degree in the field of near-field optical microscopy. Since 1998 he works at the Research Center of Carl Zeiss, where he is the responsible Lab Manager for microstructured optics. His current research interests are hybrid diffractive/refractive optics, subwavelength structures, refractive microoptics, and high resolution optics.

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Geoffrey W. Burr received his B.S. in Electrical Engineering (EE) and B.A. in Greek Classics from the State University of New York at Buffalo in 1991. That year Eta Kappa Nu selected him as the Alton B. Zerby Outstanding EE Senior in the U.S. He received his M.S. and Ph.D. in Electrical Engineering from the California Institute of Technology in 1993 and 1996, respectively, under the supervision of Professor Demetri Psaltis. Since that time, Dr. Burr has worked at the IBM Almaden Research Center in San Jose, California, where he is currently a Research Staff Member. He has worked extensively in holographic data storage, volume holography, signal processing and systems tradeoffs in data storage, and optical information processing. Dr. Burr's current research interests also include nanophotonics, numerical modeling for design optimization, and phase-change nonvolatile memory. He is a member of SPIE, OSA, IEEE, Eta Kappa Nu, and Tau Beta Pi.

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Karsten Buse received his Ph.D. from the University of Osnabrück, Germany. Since 2000 he is holding the Heinrich Hertz professorship for physics at the University of Bonn. His research focus is on nonlinear-optical and photosensitive dielectric materials like nonlinear and photorefractive crystals. He authored and co-authored more than 150 publications and more than 20 patents in this field.

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Dr. Click received her Ph.D. from the University of Missouri – Rolla in ceramic engineering focused in contamination in phosphate laser glasses. She is now involved in the research and development necessary to commercialize Schott's inorganic low-temperature reactive bonding technology for producing light-weighted Zerodur optics and precision optical components.

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Mark Davis earned his Ph.D. in Geology from Yale University in 1996, focusing on the kinetics of nucleation in glass-forming melts and related topics. Since then, his research has centred on the development of new glass-ceramic materials for a range of applications, in addition to continued efforts towards a more fundamental understanding of crystallization processes.

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Wolfgang Demtröder studied Physics, Mathematics and Science of Music at the Universities of Münster, Tübingen and Bonn. He received his Ph.D. in 1961 with Prof. Paul in Bonn. He was research assistant in Freiburg, visiting fellow at JILA in Boulder, Colorado and since 1970 he is Professor of Physics at the University of Kaiserslautern, and visiting Professor at the Universities at Stanford (USA), Kobe (Japan), New South Wales in Sydney (Australia) and at the Technical University in Lausanne (Switzerland). His fields of research are high resolution laser spectroscopy of molecules and metal-clusters, time resolved spectroscopy, spectroscopy of collision processes. He received the Max Born Prize in 1994 and the Heisenberg Medal 2001.

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Chapter A.6

Henrik Ehlers is working in the field of optical thin films. He studied physics in Hannover, Germany, and is currently head of the Process Development Group in the department of Thin Film Technology at the Laser Zentrum Hannover. The focus of the group is on R&D in modern deposition processes, in situ process monitoring, and advanced process automation.

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Rainer Engelbrecht studied electrical engineering at the University of Erlangen-Nürnberg and received his diploma and Dr. degree in 1995 and 2001, respectively. The doctoral thesis was on gas analysis in CO₂ lasers by diode laser spectroscopy. His current research fields are nonlinear fiber optics, Raman fiber lasers and low-noise photo receivers.

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Martin Fally earned both his Ph.D. in physics (1996) and his habilitation in solid-state physics (2003) from the Vienna University, Austria. Since then he is Associate Professor at the Department for Experimental Physics. In 2003–2004 he held a Mercator Visiting-Professorship at the University of Osnabrück, Germany. He authored or co-authored more than 40 publications in the fields of structural phase transitions (experimental and theoretical), quasi one-dimensional systems (theoretical), neutron-scattering, neutron-diffraction, photorefractive materials, holographic scattering (experimental and theoretical). In 2001 he was awarded the Prize of the City of Vienna for research in natural sciences.

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Ms. Yun-Hsing Fan is currently a Ph.D. candidate at the School of Optics/CREOL, University of Central Florida. Her current research is to develop novel electronic liquid crystal (LC) lenses and fast-response infrared phase modulators for optical communications. Her future work will focus on polarization-independent LC lens and fast switching polymer-network LC modulators for far-infrared and visible regions.

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Enrico Geißler completed his studies of electrical engineering at the University of Applied Sciences Jena, Germany, in 1998. Since graduation he has been at the Research Center of Carl Zeiss, where he is currently Senior Scientist for Digital Visualization Systems. His current research interests are spatial light modulators and MEMS.

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Ajoy Ghatak has published more than 170 research papers in international journals and is the co-author (with Professor Thyagarajan) of six books. He is a Fellow of the Optical Society of America (OSA) and is the recipient of the 2003 OSA Esther Hoffman Beller award, the International Commission for Optics Galileo Galilei award and the CSIR S.S. Bhatnagar award. His areas of interests are fiber optics and quantum mechanics.


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Dr. Alexander Goushcha (aka Gushcha) is a Chief Scientist and CTO at SEMICOA, a California-based manufacturer of high-reliability silicon transistors and optoelectronics. He obtained his Ph.D. degree in Physics from the Institute for Physics, Ukrainian Academy of Sciences in Kyiv (Ukraine). He has been working in the fields of semiconductor physics and technology, biophysics and molecular electronics, and nonlinear optics at the Institute for Physics, Kyiv, Ukraine, MPI Strahlenchemie, Mülheim a.d. Ruhr, Germany, and UC Riverside, CA. Dr. Goushcha is the author of about 100 technical papers in referred journals and holds 10 patents and patent applications.

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Daniel R. Grischkowsky is a Regents Professor and the Bellmon Professor of Optoelectronics at Oklahoma State University. He received his B.S. from Oregon State University in 1962 and his Ph.D. degree in physics from Columbia University in 1968. In 1969 he joined the IBM Watson Research Center, Yorktown Heights, New York, where he developed and experimentally verified the adiabatic following model in 1972. In 1982 his research group developed the optical-fiber pulse compressor, and later in 1989 developed the technique of THz time-domain spectroscopy (THz-TDS). In 1993 he relocated to Oklahoma State University to pursue THz-TDS applications. He is a fellow of The American Physical Society (APS), The Institute of Electrical and Electronics Engineers (IEEE) and The Optical Society of America (OSA). He was awarded the Boris Pregel Award (1985) by the New York Academy of Sciences for the development of the optical fiber pulse compressor, the R.W. Wood Prize (1989) from OSA for distinguished contributions to the field of optical pulse compression, particularly for pioneering work on the use of optical fibers for generating ultrashort pulses of light, and the William F. Meggers Award (2003) from OSA for seminal contributions to the development and application of THz time-domain spectroscopy.

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Professor Haglund earned his Ph.D. in experimental nuclear physics from the University of North Carolina, Chapel Hill. He was staff member, Los Alamos National Laboratory from 1975 to 1984. Since 1984 he is Professor of Physics at Vanderbilt University. He was Alexander von Humboldt awardee in 2003. His current research activities are in nonlinear optics in metal and metal-oxide nanoparticles; size and dimensional effects in metal-insulator transitions; and ultrafast mid-infrared laser processing of polymers and organic materials.


Stefan Hansmann

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Stefan Hansmann received his Ph.D. from the Technical University of Darmstadt for his work on simulation and realization of DFB laser diodes. He worked 10 years in the field of optoelectronics at the research center of Deutsche Telekom and become the head of a research group focusing on the application of photonic technologies in telecommunication. Thereafter he served as a technical manager in several companies of III/V semiconductor industry and is now the chief technical officer of AL Technologies GmbH in Darmstadt, commercializing high speed InP based semiconductor laser technology.

**Joseph Hayden**

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Dr. Joseph Hayden has a B.S. in Physics from Saint Joseph's University and a Ph.D. in Chemical Physics from Brown University. He joined the Schott Group in 1985, where he has worked in glass composition and process development with emphasis on laser, nonlinear and technical glasses. He is presently an Executive Scientist at Schott's North American Regional R&D site in Duryea, Pennsylvania.

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Dr. Joachim Hein is a scientist at the faculty of physics of the University of Jena since many years. He is working on femtosecond-lasers, new laser materials for broad-band amplification and applications of ultra-high peak power light sources. He is an expert for diode-pumped high-energy laser systems as well as solid-state laser design and modelling.

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Stefan W. Hell is credited with having both conceived and validated the first viable concept for breaking Abbe's diffraction-limited resolution barrier in a light-focusing microscope. He leads the Department of NanoBiophotonics at the Max Planck Institute for Biophysical Chemistry as well as the High-Resolution Optical Microscopy division at the German Cancer Research Center (DKFZ) in Heidelberg.

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Until his retirement at the end of 2003, Dr. Jürgen Helmcke headed the department "Quantum Optics and Length Unit" at the Physikalisch-Technische Bundesanstalt in Braunschweig, Germany. His main interests are in the fields of precision laser spectroscopy, laser cooling, optical and atom interferometry, and optical frequency measurements. From 1977 to 1978 he spent a year as NATO scholar with Dr. John L. Hall at the Joint Institute of Astrophysics in Boulder, CO. In 1999, together with F. Riehle, H. Schnatz, and T. Trebst, J. Helmcke received the Helmholtz Price of Metrology for the paper "Atom interferometer in the time domain for precision measurements".

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Professor Hillmer received his doctor and habilitation degrees from Stuttgart and Darmstadt University, respectively. He worked 10 years in telecommunication industry (German Telekom and NTT Japan) on design, implementation and characterization of fast and tunable semiconductor lasers. As a full professor at Kassel University since 1999, he deals with optical MEMS and nanotechnology and is a coordinator in the Hess Nano Network (nnh-9). He published more than 200 papers, holds 14 patents and received the European Grand Prix of Innovation Awards 2006

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Günter Huber is Professor of Physics at the Institute of Laser-Physics, University of Hamburg, Germany. His research on solid-state lasers includes the growth, development and optical spectroscopy of laser materials, new diode-pumped lasers in the near infrared and visible spectral region, as well as up-conversion lasers. He is Fellow of the Optical Society of America and received the Quantum Electronics and Optics Prize of the European Physical Society in 2003.

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Chapter D.20, Sect. 20.1

Dr. Imlau studied physics at the University of Cologne, where he received his Ph.D. for work on centrosymmetric photorefractive crystals. Since 2002 he is Junior-Professor at the University of Osnabrück and team leader of the photonics work group. His research is focused on the field of condensed matter and optics, in particular on nonlinearities of optical materials (optical damage, nonlinear light scattering, photoswitchable compounds, unconventional photorefractive materials, space charge waves). Having his expertise in holography, he authored more than 40 publications in refereed journals, 4 book articles, and 8 international patents.

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Kuon Inoue received his Ph.D. from the University of Tokyo, Japan in 1970. Since 1967, he worked at the Department of Physics, Shizuoka University. In 1984, he joined the faculty of the Research Institute for Electronic Sciences, Hokkaido University. After retirement in 2001, he is now a guest Professor at Chitose Institute of Science and Technology and is a Fellow of the Toyota Physics and Chemistry Research Institute. He has worked in solid-state physics, laser spectroscopy in solids, and photonic crystals.

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Chapter C.11, Sect. 11.5

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Ferenc Krausz was awarded his M.S. in Electrical Engineering at Budapest University of Technology in 1985, his Ph.D. in Quantum Electronics at Vienna University of Technology in 1991, and his “Habilitation” degree in the same field at the same university in 1993. He joined the Department of Electrical Engineering as Associate Professor in 1998 and became Full Professor in the same department in 1999. In 2003 he was appointed as Director of Max Planck Institute of Quantum Optics in Garching, Germany, and since October 2004 he has also been Professor of Physics and Chair of Experimental Physics at Ludwig Maximilian’s University of Munich. His research has included nonlinear light-matter interactions, ultrashort light pulse generation from the infrared to the X-ray spectral range, and studies of ultrafast microscopic processes. By using chirped multilayer mirrors, his group made intense light pulses comprising merely a few wave cycles available for a wide range of applications and utilized them for pushing the frontiers of ultrafast science into the attosecond regime. His most recent research focuses on attosecond physics: the control and real-time observation of the atomic-scale motion of electrons. He co-founded Femtolasers GmbH, a Vienna-based company specializing in cutting-edge femtosecond laser sources.

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Eckhard Krätzig received his Ph. D. degree in physics from the Johann Wolfgang Goethe University of Frankfurt/Main, Germany in 1968. Then he joined the Philips Research Laboratories Hamburg, where he headed the Solid State Physics Group. Since 1980 he has been a Professor of Applied Physics at the University of Osnabrück. During the last years his research interests were focused on photorefractive effects and light-induced charge-transport phenomena.

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Dr. Kück is working group leader for laser radiometry at the Physikalisch-Technische Bundesanstalt, the German National Metrology Institute. He obtained his Ph.D. in 1994 and habilitated in 2001 in the field of solid-state lasers. His main research topic is the development of new methods, procedures and standards for the high-precision measurement of laser power and laser pulse energy.

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Anne L’Huillier defended her Ph.D. thesis in Paris in 1986. She worked at the Commissariat à l’Energie Atomique in Saclay, France, until 1995 and then moved to Lund University, Sweden, where she became professor in 1997. Her current research is on the generation of high-order harmonics of laser light in gases and its application to attosecond science. In 2003, she got the Julius Springer prize for Applied Physics together with F. Krausz. She became member of the Royal Swedish Academy of Sciences in 2004.

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Bruno Lengeler is emeritus professor of physics and former head of a physics institute at Aachen university. He is a solid-state physicist who has worked for many years on spectroscopy and imaging with synchrotron radiation, in particular on the development of parabolic refractive X-ray lenses. He was Director of Research at the European Synchrotron Radiation Facility.



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Dr. Martin Letz studied physics at the universities of Braunschweig, Stuttgart (Germany) and Tartu (Estonia) and finished his Ph.D. in 1995 at Stuttgart University in the field of theoretical solid state physics with a work on magnetic polarons. In the following he worked as a post-doctoral fellow at Queen's University, Kingston (Canada) and at the University of Mainz (Germany). During this time he performed investigations on statistical physics of strongly correlated quantum-mechanical systems of strongly correlated classical systems, light scattering and on the dynamics of the glass transition in molecular fluids. In 2001 Martin Letz joined the central research of Schott Glass.



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Gerd Leuchs studied physics and mathematics at Cologne and received his Ph.D. in 1978. After research years in USA, he headed the German gravitational wave detection group, then became technical director at Nanomach AG, Switzerland. Since 1994 he has been Professor of Physics at the University of Erlangen, since 2003 also director of the Max Planck research group of optics, information and photonics.

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Norbert Lindlein received in 1996 his Ph.D. from the Friedrich-Alexander University Erlangen–Nürnberg (Germany). In 2002 he finished his habilitation in physics and is a member of the Physics Faculty of the University of Erlangen–Nürnberg since. His research interests include the simulation and design of optical systems, diffractive optics, microoptics and optical measurement techniques using interferometry or Shack–Hartmann wavefront sensors.



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Stefano Longhi is Associate Professor of Physics of Matter at the Polytechnic Institute of Milan. He has authored more than 100 papers in the fields of laser physics, photonics, nonlinear and quantum optics. Professor Longhi is Fellow of the Institute of Physics and member of the J. Physics-B editorial board. In 2003 he was awarded with the Fresnel Prize of the European Physical Society.



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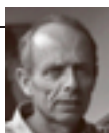


Chapter A.5, Sects. 5.1.4, 5.8, 5.10

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Chapter C.11, Sect. 11.7

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Chapter B.8, Sect. 8.3

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Chapter C.11, Sect. 11.12

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Chapter D.14

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Chapter A.5, Sects. 5.9.4, 5.10

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Chapter C.11, Sect. 11.2.4

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Chapter A.5, Sects. 5.1.1, 5.1.6, 5.1.7, 5.1.8, 5.10

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Chapter D.21

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Chapter A.5, Sects. 5.9, 5.10

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Chapter A.6

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Chapter A.5, Sects. 5.3, 5.10

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Chapter C.11, Sect. 11.11

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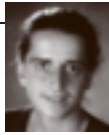


Chapter D.20, Sect. 20.2

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Chapter C.11, Sect. 11.1

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