

SELECTED PUBLICATION LIST FOR
DANIEL G. STEARNS

"Simple Method of Bond-Length Determination and Test of Phase Transferability With Use of Extended X-ray Absorption Fine Structure Linear Phase Function", D. G. Stearns and M. B. Stearns, *Phys. Rev. B*, **27**, 3842 (1983).

"Broadening of the Extended X-ray Absorption Fine Structure Due to the Finite Lifetime of the K hole", D. G. Stearns, *Phil. Mag. B*, **49**, 541 (1984).

"Early Photoluminescence Decay in a-Si:H", D. G. Stearns, *Phys. Rev. B*, **30**, 6000 (1984).

"Multilayer Structures for X-ray Laser Cavities", N. M. Ceglio, D. G. Stearns and A. M. Hawryluk, *Proc. SPIE*, **563**, 360 (1985).

"Approaches to Ultrafast Neutron Detectors", C. L. Wang, R. Kalibjian, M. S. Singh, J. D. Wiedwald, D. E. Campbell, E. M. Campbell, M. D. Cable, W. R. Graves, S. M. Lane, R. A. Lerche, R. H. Price, D. G. Stearns, G. A. Mourou and S. G. Prussin, *Rev. Sci. Instrum.* **56**, 1096 (1985).

"TEM and X-ray Analysis of Multilayer Mirrors and Beamsplitters", D. G. Stearns, N. M. Ceglio, A. M. Hawryluk, M. B. Stearns, A. K. Petford-Long, C-H. Chang, K. Danzmann, M. Kuhne, P. Muller and B. Wende, *Proc. SPIE*, **688**, 91 (1986).

"X-ray Laser Cavity Experiments", N. M. Ceglio, D. P. Gaines, J. Trebes, A. M. Hawryluk, D. G. Stearns and G. L. Howe, *Proc. SPIE*, **688**, 44 (1986).

"Characterization of Multilayer Structures for Soft X-ray Laser Research", M. Kuhne, K. Danzmann, P. Muller, B. Wende, N. M. Ceglio, D. G. Stearns and A. M. Hawryluk, *Proc. SPIE*, **688**, 76 (1986).

"Soft X-ray Beamsplitters and Highly Dispersive Multilayer Mirrors for Use as Soft X-ray Cavity Components", A. M. Hawryluk, N. M. Ceglio, D. G. Stearns, K. Danzmann, M. Kuhne, P. Muller and B. Wende, *Proc. SPIE*, **688**, 81 (1986).

"Extended X-ray Absorption Fine Structure", D. G. Stearns and M. B. Stearns, in *Microscopic Methods in Metals*, U. Gonser, ed., (Springer-Verlag, Berlin, 1986) pp. 153-192.

"Development of a Novel Soft X-ray Source for Laboratory Applications", D. G. Stearns, *Nucl. Inst. & Meth. in Phys. Res.*, **A242**, 364 (1986).

"Development of an X-ray Framing Camera", D. G. Stearns, J. D. Wiedwald, W. M. Cook and R. L. Hanks, *Rev. Sci. Instrum.*, **57**, 2455 (1986).

"Soft X-ray Laser Cavities", N. M. Ceglio, D. G. Stearns, A. M. Hawryluk, T. W. Barbee, K. Danzmann, M. Kuhne, P. Mueller, B. Wende, M. B. Stearns, A. K. Petford-Long and C-H. Chang, *J. de Physique*, **47**, 277 (1986).

"X-ray Optical Multilayer Structures Studied Using High Resolution Electron Microscopy", M. B. Stearns, A. K. Petford Long, C.-H. Chang, D. G. Stearns, N. M. Ceglio and A. M. Hawryluk, *Mat. Res. Soc. Symp. Proc.*, **77**, 345 (1987).

"High-Resolution Electron Microscopy Study of X-ray Multilayer Structures", A. K. Petford-Long, M. B. Stearns, C.-H. Chang, S. R. Nutt, D. G. Stearns, N. M. Ceglio and A. M. Hawryluk, *J. Appl. Phys.*, **61**, 1422 (1987).

"Generation of Ultrashort X-ray Pulses", D. G. Stearns, O. L. Landen, E. M. Campbell and J. H. Scofield, *Phys. Rev. A*, **37**, 1684 (1988).

"Multipass Amplification of Soft X-rays in a Laser Cavity", N. M. Ceglio, D. G. Stearns, D. P. Gaines, A. M. Hawryluk and J. E. Trebes, *Opt. Lett.*, **13**, 108 (1988).

"Demonstration of Guided-Wave Phenomena at Extreme-Ultraviolet and Soft-X-ray Wavelengths", N. M. Ceglio, A. M. Hawryluk, D. G. Stearns, M. Kuhne and P. Muller, *Opt. Lett.*, **13**, 267 (1988).

"Time-Resolved Measurement of Double Pass Amplification of Soft X-rays", N. M. Ceglio, D. P. Gaines, R. A. London, J. E. Trebes, D. G. Stearns, *Appl. Opt.*, **27**, 5022 (1988).

"Applications of Microfabrication Technology to X-ray Laser Cavities", A. M. Hawryluk, N. M. Ceglio and D. G. Stearns, *J. Vac. Sci. Technol. B*, **6**, 2153 (1988).

"X-ray Sources from Picosecond Laser Plasma Excitation", O. L. Landen, D. G. Stearns, E. M. Campbell and J. H. Scofield, *Proc. SPIE*, **913**, 169 (1988).

"Ultrafast Framing of X-ray Images", D. G. Stearns, J. D. Wiedwald, B. M. Cook, R. L. Hanks and O. L. Landen, *Proc. SPIE*, **981**, 161 (1989).

"Double Pass Amplification of Laser Radiation at 131 Å", N. M. Ceglio, D. P. Gaines, D. G. Stearns and A. M. Hawryluk, *Opt. Commun.*, **69**, 285 (1989).

"The Scattering of X-rays from Non-Ideal Multilayer Structures", D. G. Stearns, *J. Appl. Phys.*, **65**, 491 (1989).

"Electrooptic Sampling of Ultrashort High Voltage Pulses", D. G. Stearns, *J. Appl. Phys.*, **65**, 1308 (1989).

- "X-ray Framing Camera for Picosecond Imaging of Laser Produced Plasmas", D. G. Stearns, J. D. Wiedwald, B. M. Cook, R. L. Hanks and O. L. Landen, *Rev. Sci. Instrum.*, **60**, 363 (1989).
- "Response of Charge-Coupled Devices to Direct Electron Bombardment", D. G. Stearns and J. D. Wiedwald, *Rev. Sci. Instrum.*, **60**, 1095 (1989).
- "Measurement of the Expansion of Picosecond Laser-produced Plasmas Using Resonance Absorption Profile Spectroscopy", O. L. Landen, D. G. Stearns and E. M. Campbell, *Phys. Rev. Lett.*, **63**, 1475 (1989).
- "Thermally-Induced Structural Modification of Mo-Si Multilayers", D. G. Stearns, M. B. Stearns, Y. Cheng, J. H. Stith, and N. M. Ceglio, *J. Appl. Phys.*, **67**, 2415 (1990).
- "Soft X-ray Projection Lithography", N. M. Ceglio, A. M. Hawryluk, D. G. Stearns, D. P. Gaines, R. S. Rosen and S. P. Vernon, *J. Vac. Sci. Technol. B* **8**, 1325 (1990).
- "Structural Characterization of Ru-B₄C Multilayers Fabricated by Magnetron Sputtering", D. G. Stearns, R. S. Rosen and S. P. Vernon, *Mat. Res. Soc. Symp. Proc.* **202**, 143 (1991).
- "Layer Formation in CuNi/C X-ray Optics", A. F. Jankowski and D. G. Stearns, *Mat. Res. Soc. Symp. Proc.* **202**, 695 (1991).
- "High-Performance Multilayer X-ray Optics", D. G. Stearns, R. S. Rosen and S. P. Vernon, *OSA Proc. on Short-Wavelength Coherent Radiation*, Vol. **11**, P. H. Bucksbaum and N. M. Ceglio eds., 152 (1991).
- "Multilayer Optics for Soft X-ray Projection Lithography: Problems and Prospects", D. G. Stearns, N. M. Ceglio, A. M. Hawryluk and R. S. Rosen, *Proc. SPIE*, **1465**, 80 (1991).
- "High-Performance Multilayer Mirrors for Soft X-ray Projection Lithography", D. G. Stearns, R. S. Rosen and S. P. Vernon, *Proc. SPIE*, **1547**, 2 (1991).
- "Thermal Stability of Mo/Si Multilayers", R. S. Rosen, M. A. Viliardos, D. G. Stearns, M. E. Kassner and S. P. Vernon, *Proc. SPIE*, **1547**, 212 (1991).
- "Annealing Studies of Ru/Si Multilayers by High-Angle Annular Dark Field Microscopy and HREM", Y. Cheng, J. Liu, M. B. Stearns and D. G. Stearns, *Proc. SPIE*, **1547**, 167 (1991).
- "Multilayer Coatings on Figured Optics", S. P. Vernon, D. G. Stearns, R. S. Rosen, N. M. Ceglio, D. P. Gaines, M. Krumrey and P. Muller, *Proc. SPIE*, **1547**, 39 (1991).

"A Normal Incidence X-ray Mirror for 70 Å", D. G. Stearns, R. S. Rosen and S. P. Vernon, *Opt. Lett.* **16**, 1283 (1991).

"Fabrication of High-Reflectance Mo-Si Multilayer Mirrors", D. G. Stearns, R. S. Rosen and S. P. Vernon, *J. Vac. Sci. Technol.* **A9**, 2662 (1991).

"Optimization of Growth Conditions of Vapor Deposited Mo-Si Multilayers", M. B. Stearns, C.-H. Chang and D. G. Stearns, *J. Appl. Phys.* **71**, 187-195 (1992).

"X-ray Scattering from Interfacial Roughness in Multilayer Structures", D. G. Stearns, *J. Appl. Phys.* **71**, 4286-4298 (1992).

"Imaging X-ray Multilayer Structures using Cross-Sectional High Resolution Electron Microscopy", Y. Cheng, D. J. Smith, M. B. Stearns and D. G. Stearns, *J. Appl. Phys.* **72**, 5165-5171 (1992).

"Imaging Performance of Multilayer X-ray Mirrors", E. Spiller, J. Wilczynski, D. Stearns, L. Golub and G. Nystrom, *Appl. Phys. Lett.* **61**, 1481-1483 (1992).

"Ion Assisted Sputter Deposition of Mo-Si Multilayers", S. P. Vernon, D. G. Stearns and R. S. Rosen, *Applied Optics* **32**, 6969-6974 (1993).

"Silicide Layer Growth Rates in Mo-Si Multilayers", R. S. Rosen, D. G. Stearns, M. A. Viliardos, M. E. Kassner, S. P. Vernon and Y. Cheng, *Applied Optics* **32**, 6975-6980 (1993).

"Multilayer Mirror Technology for Soft X-ray Projection Lithography", D. G. Stearns, R. S. Rosen and S. P. Vernon, *Applied Optics* **32**, 6952-6960 (1993).

"Kinetics of Interlayer Growth and Changes in Residual Elastic Strain During Annealing of Mo/Si Multilayers", R. S. Rosen, D. G. Stearns, M. E. Kassner, J.-I. Koike, Y. Cheng and S. P. Vernon, *Nanostructured Mat.* **3**, 195 (1993).

"Multilayer X-ray Mirrors: Interfacial Roughness, Scattering and Image Quality", E. Spiller, D. Stearns and M. Krumrey, *J. Appl. Phys.* **74**, 107-118 (1993).

"A Stochastic Model for Thin Film Growth and Erosion", D. G. Stearns, *Appl. Phys. Lett.* **62**, 1745-1747 (1993).

"Beryllium-Based Multilayer Structures", D. G. Stearns, K. M. Skulina, M. Wall, C. S. Alford, R. M. Bionta, D. M. Makowiecki, E. M. Gullikson, R. Soufli, J. B. Kortright and J. H. Underwood, *Mat. Res. Soc. Symp. Proc.* **382**, 329 (1995).

"Ultrasoother, Conducting Films Composed of Mo/Si Multilayers", *Mat. Res. Soc. Symp. Proc.* **403**, 183 (1996).

- “Nonspecular X-ray Scattering in a Multilayer-Coated Imaging System”, D. G. Stearns, D. P. Gaines, D. W. Sweeney and E. M. Gullikson, *J. Appl. Phys.* **84**, 1003 (1998).
- “Assymmetric Extreme Ultraviolet Scattering from Sputter-Deposited Multilayers”, E. M. Gullikson and D. G. Stearns, *Phys. Rev. B* **59**, 273 (1999).
- “EUV Scattering and Flare of 10X Projection Cameras”, E. M. Gullikson, J. Bokor, K. A. Goldberg, P. P. Naulleau, J. H. Underwood, S. L. Baker, E. A. Spiller, J. S. Taylor, J. E. Bjorkholm, J. E. M. Goldsmith, and D. G. Stearns, *Proc. SPIE* **3676**, 717 (1999).
- “Nonspecular Scattering from Extreme Ultraviolet Multilayer Coatings”, D. G. Stearns and E. M. Gullikson, *Physica B* **283**, 84 (2000).
- “Investigating the Growth of Localized Defects in Thin Films using Gold Nanospheres”, P. B. Mirkarimi and D. G. Stearns, *Appl Phys. Lett.* **77**, 2243 (2000).
- “Defects from Substrate Particle Depend on the Sputter Deposition Process”, P. B. Mirkarimi, S. L. Baker, M. A. Wall, P. A. Kearney and D. G. Stearns, *Sol. St. Technol.*, 95 (November, 2000).
- “Investigation of the Amorphous-to-Crystalline Transition in Mo/Si Multilayers”, S. Bajt, D. G. Stearns and P. A. Kearney, *J. Appl. Phys.* **90**, 1017 (2001).
- “Instrumentation for In Vivo Imaging of Bioluminescent Reporters”, B. W. Rice, M. Cable, B. Nelson and D. Stearns, *Proc. Bioluminescence and Chemiluminescence 2000*, (World Scientific, Singapore, 2001) p. 489.
- “Technique Employing Gold Nanospheres to Study Defect Evolution in Thin Films”, P. B. Mirkarimi, S. L. Baker and D. G. Stearns, *J. Vac. Sci. Technol. B* **19**, 628 (2001).
- “An Ion-Assisted Mo-Si Deposition Process for Planarizing Reticle Substrates for Extreme Ultraviolet Lithography”, P. B. Mirkarimi, E. A. Spiller, D. G. Stearns, V. Sperry and S. L. Baker, *IEEE J. Quant. Elect.* **37**, 1514 (2001).
- “Method for Repairing Mo/Si Multilayer Thin Film Phase Defects in Reticles for Extreme Ultraviolet Lithography”, P. B. Mirkarimi, D. G. Stearns, S. L. Baker, J. W. Elmer, D. W. Sweeney and E. M. Gullikson, *J. Appl. Phys.* **91**, 81 (2002).
- “Practical Approach for Modeling Extreme Ultraviolet Lithography Mask Defects”, E. M. Gullikson, C. Cerjan, D. G. Stearns, P. B. Mirkarimi and D. W. Sweeney, *J. Vac. Sci. Technol. B* **20**, 81 (2002).
- “EUVL Mask Blank Repair”, A. Barty, P. B. Mirkarimi, D. G. Stearns, D. W. Sweeney, H. N. Chapman, W. M. Clift, S. D. Hector and M. Yi, *Proc. SPIE* **4688**, 385 (2002).

“Correction of figure errors on optical surfaces by laser-induced contraction of Mo/Si multilayers”, S. P. Hau-Riege and D. G. Stearns, *Opt. Lett.* **28**(6), 456-8 (2003).

“High-Performance Mo-Si Multilayer Coatings for Extreme-Ultraviolet Lithography by Ion-Beam Deposition”, E. Spiller, S. L. Baker, P. B. Mirkarimi, V. Sperry, E. M. Gullikson and D. G. Stearns, **42**, 4049 (2003).

“Localized Defects in Multilayer Coatings”, D. G. Stearns, P. B. Mirkarimi and E. Spiller, *Thin Solid Films* **446**, 37 (2004).

“Developing a Viable Multilayer Coating Process for Extreme Ultraviolet Lithography Reticles”, P. B. Mirkarimi, E. Spiller, S. L. Baker, V. Sperry, D. G. Stearns and E. M. Gullikson, *J. Microlith., Microfab., Microsyst.* **3**, 139 (2004).

“Repairing Amplitude Defects in Multilayer-Coated Extreme Ultraviolet Lithography Reticles by Use of a Focused Ion Beam”, A. Barty, S. Hau-Riege, D. Stearns, M. Clift, P. Mirkarimi, E. Gullikson, H. Chapman and D. Sweeney, *Appl. Opt.* **43**, 6545 (2004).

“High-temperature stability multilayers for extreme-ultraviolet condenser optics”, S. Bajt and D. G. Stearns, *Appl. Opt.* **44**, 7735-7743 (2005).

“Advancing the ion beam thin film planarization process for the smoothing of substrate particles”, P.B. Mirkarimi, E. Spiller, S.L. Baker, J.C. Robinson, D.G. Stearns, J.A. Liddle, F. Salmassi, T. Liang and A.R. Stivers, *Microelect. Eng.* **77**, 369 (2005).

“A Si-based, Sequential Coat-and-Etch Process to Fabricate Nearly Perfect Substrate Surfaces”, P. B. Mirkarimi, E. Spiller, S. L. Baker, D. G. Stearns, J. C. Robinson, D. L. Olynick, F. Salmassi, J. A. Liddle, T. Liang and A. R. Stivers, *J. Nanoscience and Nanotechnology* **6**, 28-35 (2006).