

**Sol M. Gruner: Publications**

**Full Publication List**

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**Sol M. Gruner: Publications****a. Papers & Book Chapters**

1. Geo. T. Reynolds and Sol M. Gruner (1975). A high gain image intensifier-spectroscopy system for *in vivo* studies of bioluminescence. *IEEE Trans. Nuc. Sci. NS-22*: 404-411.
2. Geo. T. Reynolds, J.R. Milch and Sol M. Gruner (1977). Image intensification of x-ray diffraction patterns from biological structures. *IEEE Trans. Nuc. Sci. NS-24*: 501-510.
3. Geo. T. Reynolds, J.R. Milch and Sol M. Gruner (1978). A high sensitivity image intensifier-TV detector for x-ray diffraction studies. *Rev. Sci. Instr.* *49*: 1241-1249.
4. Sol M. Gruner, J.R. Milch and Geo. T. Reynolds (1978). Evaluation of area photon detectors by a method based on the detective quantum efficiency (DQE). *IEEE Trans. Nuc. Sci. NS-25*: 562-565.
5. D.T. Barry, M.J. Costello and Sol M. Gruner (1980). Freeze-fracture study of vesicle disruption and inversion in isolated bovine rod outer segment disks. *Exp. Eye Res* *30*: 501-510.
6. Sol M. Gruner (1981). Controlled humidity gas circulators. *Rev. Sci. Instr.* *52*: 134-136.
7. Sol M. Gruner, G. Kirk, L. Patel and H.R. Kaback (1982). A method for rapid continuous monitoring of solute uptake and binding. *Biochem.* *21*: 3239-3243.
8. Sol M. Gruner, J.R. Milch and Geo. T. Reynolds (1982). A slow scan SIT-TV x-ray detector for quantitative recording of weak x-ray diffraction images. *Rev. Sci. Instr.* *53*: 1770-1778.
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10. D.L. May and Sol M. Gruner (1982). Diamagnetic anisotropy as a probe of electron delocalization in polymers: application to polydiacetylenes, polyethylene, polyethylene terephthalate. *J. Physics C* *15*: L631-L636.
11. E.E. Uzgiris and Sol M. Gruner (1982). Electrophoretic mobility of isolated rod outer segment disk vesicles by laser Doppler spectroscopy. *Biochem. & Biophys. Res. Communications* *109*: 402-407.
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16. Sol M. Gruner, K.J. Rothschild and N.A. Clark (1982). X-ray diffraction and electron microscope study of phase separation in rod outer segment photoreceptor membrane multilayers. *Biophys. J.* 39: 241-251.
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18. Geo. T. Reynolds, A.L. Walton and S.M. Gruner (1983). Spatial, temporal and spectral observations of sonoluminescence by means of image intensification. *IEEE Trans. Nuc. Sci.* NS-30: 440-444.
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  32. E.F. Eikenberry, S.M. Gruner and J.L. Lowrance (1986). A two-dimensional x-ray detector with a slow scan charge coupled device readout. *IEEE Trans. Nucl. Sci.* 33: 542-545.
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- 2b. Yi-Fan Chen et al. thesis paper
- 3b. Kelly Jenkins, Martin J Fossat, Siwen Zhang, Durgesh K Rai, Sean Klein, Richard E Gillilan, Zachary White, Grayson Gerlich, Scott A. McCallum, Roland Winter, Sol M Gruner, Doug Barrick, Catherine A Royer. Cavities in Context: Distinct Positional Consequences of Cavities on the Folding Landscape of a Repeat Protein. (Submitted to PNAS)
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- 91d. P. Urayama, S.M. Gruner, G. Phillips Jr. (1999). High pressure x-ray crystallographic structure of myoglobin. XVIII Internat. Union of Crystall. Congress, Glasgow, Scotland, 4-13 Aug. 1999.
- 92d. P. Abbamonte, K.D. Finkelstein, M.D. Collins, S.M. Gruner (2003). Imaging charge disturbances in water with 41.3 attosecond time resolution. American Physical Society, March Meeting, Austin, TX, Session Y14 – Measurement and application of coherent and ultra-short x-rays. FOCUS session, Friday morning, March 7, 2003 Room 8C, Austin Convention Center.
- 93d. M.D. Collins, S.M. Gruner, E.N. Spudich, J.L. Spudich, K.J. Rothschild (2003). Understanding lyotropic lipid matrices for membrane protein crystallization. Poster delivered at the 47<sup>th</sup> Annual meeting of the Biophysical Society, San Antonio, TX, March 1-5, 2003. (Note: The abstract was delivered late so it did not appear in the published book of abstracts.)
- 94d. J. A. Lundbaek, P. Birn, S. E. Tape, G. Toombes, R. Sogaard, C. Nielsen, S. M. Gruner, A. J. Hansen, O. S. Andersen (2004). Capsaicin modulation of gramicidin and voltage-dependent sodium channel function: going beyond monolayer curvature. 58<sup>th</sup> Annual Meeting and Symposium of the Society of General Physiologists, Woods Hole, MA, September 8-12, 2004. *J. Gen. Physiology* 124 : 12A
- 95d. Q. Shen, I. V. Bazarov, D. H. Bilderback, J. D. Brock, K. D. Finkelstein, S. M. Gruner, G. Hoffstaetter, C. Sinclair, R. Talman, M. Tigner, (2004). Ultrafast Science Applications with an Energy Recovery Linac Source. 2004 Workshop on Ultrafast X-Ray Science, La Jolla Marriott, San Diego, CA, April 28 – May 1, 2004.
- 96d. S. Mahajan, S. Renker, P.F.W. Simon, J.S. Gutmann, A. Jain, Y.M. Zhang, S.M. Gruner, L.J. Fetters, G.W. Coates & U. Weisner (2003). Organic-inorganic nanostructured materials through self assembly of a new set of amphiphilic block copolymers. *Abstr. Pap. Amer. Chem. Soc.*, 225: 91-PMSE Part 2 Mar 2003.
- 97d. S.M. Gruner, A. Ercan, M.J. Renzi, D.R. Schuette, M.W. Tate, T. Hontz & W. Vernon (2004). Recent analog x-ray pixel array detector (APAD) developments. IEEE 2004 Nuc. Sci. Symposium, Rome, Oct. 16-22, 2004.
- 98d. A.G. Angello, F. Augustine, A. Ercan, S. Gruner, R. Hamlin, T. Hontz, M. Renzi, D. Schuette, M. Tate, W. Vernon (2004). Development of a mixed-mode pixel array detector for macromolecular crystallography. IEEE 2004 Nuc. Sci. Symposium, Rome, Oct. 16-22, 2004.
- 99d. A.R. Woll, R. Rong, D.H. Bilderback, S. Gruner, N. Gao, C. Bisulca & J. Mass (2004). Confocal x-ray fluorescence (XRF) microscopy: A new technique for the

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- nondestructive compositional depth profiling of paintings. Talk OO2.5, 2004 MRS Fall Meeting, Boston, MA 29 Nov - 3 Dec, 2004.
- 100d. X.Liu, S. K., Cheong, C. F. Powell, J. Wang, D. L. S. Hung, J. R. Winkelman, M. W. Tate, A. Ercan, D. R. Schuette, L. Koerner, S. M. Gruner. Near-field spray characterization of multi-hole fuel injector for direct injection gasoline engines using ultrafast x-tomography. Talk at ILASS (International Liquid Atomization and Spray Systems) -Americas 2005, Irvine, CA, 22-25 May, 2005.
- 101d. N. Ando, P. Chenevier, S. M. Gruner, A new high pressure SAXS cell for protein denaturation studies on microvolumes. 15<sup>th</sup> IUPAB & 5<sup>th</sup> EBSA International Biophysics Congress 2005. (Montpellier, France, 27 Aug. - 1 Sept., 2005).
- 102d. C. Kim, S. M. Gruner (2005), High Pressure Cooling of Protein Crystals without Cryoprotectants. XX Congress of the International Union of Crystallography (IUCr), Florence, Italy, 23-31 August 2005. Abstract MS33.26.5. Acta Cryst. A61 : C47.
- 103d. C.U. Kim, R. Kapfer, S.M. Gruner (2005). High pressure freezing of protein crystals without cryoprotectants. Biophys. J. 88(1):144a, part 2, Supp. S. 2005 Biophysical Soc. Annual Meeting, Long Beach, CA, Feb. 12-16, 2005.
- 104d. Chae Un Kim, Sol M. Gruner (2005). High pressure cooling of protein crystals without cryoprotectants. Amer. Crystallographic Assoc. annual meeting, Orlando, FL, 28 May - 2 June 2005.
- 105d. Jonathan C. Trenkle, Lucas Koerner, Sol M. Gruner, Timothy P. Weihs, Todd C. Hufnagel ( 2006) In-situ x-ray diffraction of phase transformations in a nanostructured reactive multilayer foils. Fifth International Conference on Synchrotron Radiation in Materials Science, Chicago, IL, July 30 – August 2, 2006.
- 106d. C. Kim, S. M. Gruner (2005), High Pressure Cooling of Protein Crystals without Cryoprotectants. XX Congress of the International Union of Crystallography (IUCr), Florence, Italy, 23-31 August 2005. Abstract P.04.10.3. Acta Cryst. A61 : C229.
- 107d. C. Kim, Q. Hao, S. M. Gruner (2006), Solution of Protein Crystallographic Structures by High Pressure Cryocooling and Noble Gas Phasing. Abstract for American Crystallographic Association Meeting Honolulu, Hawaii, 22-27 July 2006.
- 108d. C. U. Kim, S. M. Gruner (2006), High Pressure Cooling of Protein Crystals Without Cryoprotectants, Poster presented at the Protein Structure Initiative 2 Bottlenecks Workshop April 13-14, 2006, Natcher Conference Center, Bethesda, MD.
- 109d. C. U. Kim, Q. Hao, S. M. Gruner (2006), Solution of Protein Crystallographic Structures By High Pressure Cryocooling and Noble Gas Phasing, Poster presented at

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the Protein Structure Initiative 2 Bottlenecks Workshop April 13-14, Natcher Conference Center, Bethesda, MD.

- 110d. C. U. Kim, Q. Hao, S. M. Gruner (2006), Solution of Protein Crystallographic Structures By High Pressure Cryocooling and Noble Gas Phasing, Abstract of poster for 2006 CHESS User Meeting, 13 June 2006.s
- 111d. B. Barstow, N. Ando, C. U. Kim, J. D'Acchioli, S. M. Gruner (2006), The Structural Basis of a Fluorescence Red Shift of Citrine Under Pressure, Abstract of poster for 2006 CHESS User Meeting, 13 June 2006.
- 112d. J. C. Trenkle, L. Koerner, M. W. Tate, S. Gruner, T. P. Weihs, T. C. Hufnagel (2006), Real-time in-situ x-ray diffraction studies of self-propagating exothermic reactions in nanostructured reactive multilayer foils, Abstract of paper for 2006 MRS Symposium U. Boston, M.A., Fall Meeting, Nov. 27 – Dec. 1, 2006.
- 113d. S. M. Gruner, (2006), Status of the Energy Recovery Linac (ERL) Project at Cornell University, Abstract of paper for 2006 SRI The Ninth International Conference on Synchrotron Radiation Instrumentation, EXCO Center, Daegu, Korea, May 28 – June 2, 2006.
- 114d. A. Kazimirov, D. M. Smilgies, Q. Shen, X. Xiao, Q. Hao, E. Fontes, D. H. Bilderback, S. M. Gruner, Y. Platonov, V. V. Martynov (2006), Multilayer X-ray Optics at CHESS, Abstract of paper for 2006 SRI The Ninth International Conference on Synchrotron Radiation Instrumentation, EXCO Center, Daegu, Korea, May 28 – June 2, 2006.
- 115d. C. U. Kim, S. M. Gruner (2006), High Pressure Cooling of Protein Crystals without Cryoprotectants, Abstract of paper for 2006 SRI The Ninth International Conference on synchrotron Radiation Instruments, EXCO Center, Daegu, Korea, May 28 – June 2, 2006.
- 116d. J.C. Trenkle, L. Koerner, M.W. Tate, S. Gruner, T.P.Weihs, T.C. Hufnagel (2006). *In-situ* x-ray diffraction of phase transformations in nanostructured reactive multilayer foils. Abstract and poster at SRMS-5, Chicago, IL, 30 July – 2 Aug. 2006.
- 117d. B. Barstow, N. Ando, C. Kim, S. M. Gruner (2007). The Fluorescence Red Shift of Citrine Under High Pressure. Biophysical Society 51<sup>st</sup> Annual Meeting, Baltimore, MD, March 3 – 7, 2007.
- 118d. N. Ando, B. Barstow, F. Heberle, S. M. Gruner (2007). Pressure Unfolding of a Large Cavity Mutant of T4 Lysozyme. Biophysical Society 51<sup>st</sup> Annual Meeting, Baltimore, MD, March 3 – 7, 2007.

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- 119d. C. Kim, Q. Hao, S. M. Gruner (2007). High Pressure Cryocooling for Macromolecular Crystal Cryoprotection and Diffraction Phasing. Biophysical Society 51<sup>st</sup> Annual Meeting, Baltimore, MD, March 3 – 7, 2007.
- 120d. Y. F. Chen, C. U. Kim, S. M. Gruner (2007). Automated High-Pressure Cryoprotection and Noble Gas Phasing For High-Throughput Protein Structure Determination. Protein Bottleneck Workshop, Natcher Conference Center, Bethesda, MD, March 19-20, 2007.
- 121d. S. M. Gruner (2006). Science Case for Energy Recovery Linac X-Ray Sources. Paper FR2004, Proceedings of LINAC 2006, Knoxville, TN, August 21-25, 2006.
- 122d. C. U. Kim, Q. Hao, S. M. Gruner (2007). High Pressure Cryocooling for Capillary Sample Cryoprotection and Diffraction Phasing at Long Wavelengths. Abstract for Poster at the 2007 CHESS Users Meeting, Cornell University, Robert Purcell Center, Ithaca, NY, June 12-13, 2007.
- 123d. C. U. Kim, Q. Hao, S. M. Gruner (2007). High Pressure Cryocooling for Capillary Sample Cryoprotection and Diffraction Phasing at Long Wavelengths. The 2007 Meeting of the American Crystallographic Association, Salt Lake City, Utah, July 21-26, 2007.
- 124d. Q. Hao, U. English, A. Kazimirov, E. Fontes, D. H. Bilderback, S. M. Gruner, C. U. Kim (2007). A New Experimental Station for Long Wavelength Crystallography. The 2007 Meeting of the American Crystallographic Association, Salt Lake City, Utah, July 21-26, 2007.
- 125d. L. J. Koerner, J. C. Trenkle, M. W. Tate, S. M. Gruner, T. P. Weihs, T. C. Hufnagel (2007). X-ray Diffraction Studies of Rapidly Propagating Reaction Fronts Using a Pixel Array Detector. Abstract for Poster at the 2007 CHESS Users Meeting, Cornell University, Robert Purcell Center, Ithaca, NY, June 12-13, 2007.
- 126d. J. C. Trenkle, L. J., Koerner, M. W. Tate, S. M. Gruner, T. P., Weihs, T. C. Hufnagel (2007). Real time x-ray diffraction studies of phase transformations during rapidly propagating reactions in nanolaminate foils. (Materials Research Society meeting, Boston, MA Nov 26-30, 2007).
- 127d. S. J. Spey, J. C. Trenkle, G. M. Fritz, E. Besnoin, O. M. Knio, B. M. Rice, L. Koerner, M. W. Tate, S. M. Gruner, T. C. Hufnagel, and T. P. Weihs (2008). Coupling ohmic heating, chemical mixing and thermal transport in the ignition and self-propagation of exothermic reactions in nanolayered materials. Presented at Spring Materials Research Soc. Meeting, March 24-27, 2008, San Francisco, CA.

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- 128d. D. Szebenyi, R. Cerione, M. Cook, U. English, R. Gillilan, S. M. Gruner, Q. Hao, X. Hong, I. Kriksunov, Q. Liu, W. Miller, d. Schuller, and S. Smith (2008). MacCHESS Initiatives: serving structural biology, preparing for an ERL. American Crystallographic Association Meeting, May 31 – June 5, 2008, Ksonoxville, TN.
- 129d. P. Ercius, T. Caswell, M. W. Tate, A. Ercan, S. M. Gruner, D. Muller (2008). A Pixel Array Detector for Scanning Transmission Electron Microscopy. Microscopy & Microanalysis 2008 Meeting, Albuquerque Convention Center, August 3-7, 2008, Albuquerque, New Mexico.
- 130d. J. C. Trenkle, L. J. Koerner, M. W. Tate, S. M. Gruner, T. P. Weihs, T. C. Hufnagel (2008). In situ x-ray microdiffraction of phase transformations in rapidly propagating, high-temperature reactions in nanolaminate foils. Joint Army-Navy-NASA-Air Force Interagency Propulsion Committee, Boston Marriott Newton, May 12-16, 2008, Newton, Massachusetts.
- 131d. Y. F. Chen, S. M. Gruner (2008). A Universal Additive for High Pressure Cryocooling. Bottlenecks Workshop, Natcher Center, NIH, April 14-16, 2008, Bethesda, MD.
- 132d. D. R. Schuette, D. Abbe, M. Allin, F. Augustine, S. M. Gruner, R. Hamlin, T. Hontz, L. J. Koerner, D. Nguyen, M. W. Tate, W. Vernon, Ng. H. Xuong (2008). The Mixed-Mode Pixel Array Detector: An X-ray Imager for Synchrotron Science, 10<sup>th</sup> International Workshop on Radiation Imaging Detectors, June 29-July 3, 2008, Helsinki, Finland.
- 133d. D. R. Schuette (2008). Performance of a Single-Chip Prototype Mixed-Mode Pixel Array Detector. 2008 NSLS/CFN Users Meeting, May 21, 2008, Brookhaven National Laboratory, New York.
- 134d. E. Fontes, D. Bilderback, S. Gruner (2008). Facility Report: the Cornell High Energy Synchrotron Source (CHESS). The Commercialization of Nanotechnology, April 10, 2008, Statler Hotel Ballroom, Cornell University, Ithaca, New York.
- 135d. Sol M. Gruner (1993). Do membrane elastic fields couple to protein function. Plenary lecture at 48<sup>th</sup> Annual Calorimetry Conference, Duke University, Durham, NC 18-22 July, 1993.
- 136d. A. R. Woll, J. Mass, C. Bisulca, R. Huang, D. H. Bilderbeck, S. Gruner, N. Gao (2005). Development of Confocal X-ray Fluorescence (XRF) Microscopy at the Cornell High Energy Synchrotron Source, Presented at “Synchrotron Radiation in Art and Archaeology”, Joint ESRF-CNRS Workshop, Grenoble, France 9-11 February, 2005.

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- 137d. C. S. Zha, D. Bilderback, R. Huang, W. Bassett, E. Fontes, K. Finkelstein, Q. Shen, S. Gruner (2008). Glass Capillary Focusing Optics for High-pressure X-ray Experimentation, site visit COMPRES SUNY- Stony Brook, 2008.
- 138d. E. F. Eikenberry, D. A. Hajduk, S. M. Gruner (1990). Effect of pH and Ionic Strength on the Phase Behavior of the POPE-POPC System, 10<sup>th</sup> International Biophysics Congress, Vancouver, Canada, July 29 – August 3, 1990.
- 139d. S. M. Gruner (1995). Organic and Inorganic Bicontinuous Mesophases, Materials Research Society, Boston, MA, Nov. 27 – Dec. 1, 1995.
- 140d. D. Perahia, S. M. Gruner, A. Gross-Sommers, J. Hittle, R. Prudhomme (1997). Polymer Cubic Lyotropic Mesophase Interaction: X-ray Study, ACS in San Francisco, April 1997.
- 141d. R. K. Prud'homme, E. Paul, A. Grosse-Sommer, J. Hittle, D. Perahia, S. Gruner, G. Warr (1997). Structured Surfactant Cubic Phases as Templates for Polymer Gels, AIChE 1997 Annual Meeting, Wilmington, Delaware, June 1997.
- 142d. R. Russell, M. W. Tate, L. W. Kwok, S. G. J. Mochrie, S. M. Gruner, D. Herschlag, L. Pollack (2000). Initial Folding Events of RNA, Adv. Photon Source, 2000.
- 143d. D. J. Thiel, R. I. Walter, S. E. Ealick, D. H., Bilderback, S. M. Gruner, E. F. Eikenberry, R. Wood (1994). Macromolecular Crystallographic Results Obtained Using a CCD Detector at CHESS, International Conf. Synchrotron Radiation Instrumentation SRI '94, National Synchrotron Light Source Brookhaven National Lab. at the State Univ. of New York at Stony Brook, July 18 – 22, 1994.
- 144d. L. Zhou, P. A. Fenter, N. Yao, M. Trau, N. Nakagawa, I. Homma, S. M. Gruner, P. M. Eisenberger, I. A., Aksay (1995). Structure of Coassembled Surfactant/Silica Films, Materials Research Society, Boston Marriott Hotel and Westin Hotel/Copley Place, Sheraton Boston Hotel, Boston, MA, Nov. 27 – Dec. 1, 1995.
- 145d. J. C. Trenkle, L. J. Koerner, M. W. Tate, S. M. Gruner, T. P. Weihs, T. C. Hufnagel (2008). In situ x-ray microdiffraction with microsecond temporal resolution of phase transformation in rapidly propagating exothermic reactions in nanoscale multilayers, MRS fall meeting, Boston, MA, December 1 – 5, 2008.
- 146d. L. Koerner (2008). X-Ray Tests of a Pixel Array Detector Designed for Coherent X-ray Imaging at the Linac Coherent Light Source, Pixel 2008 International Workshop, Fermilab, Batavia, IL, September 23 – 26, 2008.

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- 147d. S. M. Gruner (2008). Status of the Energy Recovery Linac (ERL) project at Cornell University. IUCr 2008 Osaka, Japan XXI Congress and General Assembly of the International Union of Crystallography, August 23-31, 2008.
- 148d. M. Tate, M. Hromalik, L. Koerner, H. Philipp, D. Schuette, S. Gruner (2008). Pixel array detectors for high count rate X-ray imaging. IUCr 2008 Osaka, Japan XXI Congress and General Assembly of the International Union of Crystallography, August 23-31, 2008.
- 149d. S.M. Gruner (2004). Overview: Neutrons at the molecular science frontier. Abstracts of the American Chemical Society. 227: U80.
- 150d. M.G. Malkowski, J.R. Luft, W.A. Pangborn, E.H. Snell, C.M. Weeks, G.T. DeTitta, M. Dumond, E. Greyhack, E. Merritt, E. Phizicky, M. Sullivan, S. Gruner & I. Jurisica (2006). The center for high-throughput structural biology. *Biochemistry and Cell Biology – Biochimie et Biologie Cellulaire* 84 : 1069-1070.
- 151d. N. Ando, B. Barstow, W.A. Baase, A. Fields, B.A. Matthews, S.M. Gruner (2009). Structural and thermodynamic characterization of T4 lysozyme mutants and the contribution of internal cavities to pressure denaturation. 53rd Annual Meeting, February 28-March 4, Boston, MA, Biophysical Society (2009).
- 152d. C. U. Kim, S. M. Gruner (2008). High pressure cryocooling for macromolecular crystallography. International Conference on High-Pressure Molecular Biophysics, Synchrotron SOLEIL, Saint Aubin, France, Dec 10-12, 2008.
- 153d. S. Gruner (2009). Integrating Pixel Array Detector Development. Meeting of the American Physical Society, Pittsburgh, PA, March 16-20, 2009.
- 154d. S. Gruner, C. U. Kim (2007). High Pressure Freezing: New Approaches, Joint NSLS and CFN Users' Meeting Celebrating 30 Years and Beyond 1979-2009, Brookhaven National Laboratory, Upton, NY, May 18-20, 2009.
- 155d. C. U. Kim, S. M. Gruner (2009). Phase Behavior of Water inside Protein Crystals. American Crystallographic Association Annual Meeting, Toronto, Canada, July 25 – 30, 2009.
- 156d. C. U. Kim, I. Kriksunov, W. A. Miller, D. M. E. Szebenyi, S. M. Gruner (2009). High Pressure Cryocooling at MacCHESS. American Crystallographic Association Annual Meeting, Toronto, Canada, July 25 – 30, 2009.
- 157d. D. J. Schuller, R. Cerione, M. Cook, U. Englich, R. E. Gillilan, S. M. Gruner, X. Hong, C. U. Kim, Q. Liu, I. Kriksunov, W. Miller, S. Smith, D. M. Szebenyi (2009).

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- MacCHESS 2009. American Crystallographic Association Annual Meeting, Toronto, Canada, July 25 – 30, 2009.
- 158d. J. F. Domsic, B. S. Avvaru, C. U. Kim, S. M. Gruner, M. Agbandje-McKenna, D. N. Silverman, R. McKenna (2009). Entrapment of Carbon Dioxide in the Active Site of Carbonic Anhydrase II. American Crystallographic Association Annual Meeting, Toronto, Canada, July 25 – 30, 2009.
- 159d. J. R. Luft, A. E. Cohen, M. E. Dumont, E. J., Grayheck, S. M. Gruner, K. Hodgson, I., Jurisica, A. McPherson, E. M. Phizicky, E. H. Snell, S. M. Soltis, C. M., Weeks, M. G. Malkowski, G. T. DeTitta (2010). Cloning through diffraction technologies developed at the Center for High-throughput Structural Biology. Abstract presented at the Keystone Structural Genomics: Expanding the Horizons of Structural Biology meeting Breckenridge, Colorado, January 8-13, 2010.
- 160d. S. M. Gruner (2010) High Pressure Cryocooling of Protein Crystals: The Enigma of Water. Abstract of an invited talk presented at the APS March Meeting, March 15-19 2010, Portland, OR. Bull. Amer. Phys Soc. Vol 55.
- 161d. S. M. Gruner, C. U. Kim, N. Ando, B. Barstow, M. Tate, Y. F., Chen (2010). High-Pressure Cryocooling of Protein Crystals: Applications to Understanding Pressure Effects on Proteins. Genomic Science 2010, Awardee Workshop VIII and Knowledgebase Workshop, Crystal City, Virginia, February 7-10, 2010.
- 162d. B. Stephenson, S. M. Gruner, I. Bazarov, D. Bilderback, B. Dunham, D. Dale, G. Hoffstaetter, M. Pfeifer, M. Tigner, and the ERL Team (2010). The Energy Recovery Linac: A Coherent, Hard X-ray Source. International Workshop on Phase Retrieval and Coherent Scattering, Germany, June 8-11, 2010.
- 163d. H. T. Philipp, M. Hromalik, M. Tate, L. Koerner, and S. M. Gruner (2010). Pixel Array Detector for X-ray Free-Electron Laser Experiments. The 16th Pan-American Synchrotron Radiation Instrumentation Conference, Argonne National Laboratory, Sept. 21-24, 2010.
- 164d. C. U. Kim, I. Kriksunov, W. A. Miller, M. Cook, D. M. E. Szebenyi, S. M. Gruner (2010). High Pressure Cryocooling at MacCHESS. The 10th Conf. Of the Asian Crystallographic Association, BEXCO, Busan, Korea, Oct. 31 – Nov. 3, 2010
- 165d. R. E. Gillilan, C. U. Kim, S. M. Gruner (2009). High Prssure CryoSAXS. XIV International Conf. On Small-Angle Scattering, Oxford, UK, Sept. 13 – 18, 2009.
- 166d. C. U. Kim, I. Kriksunov, W. A. Miller, M. Cook, D. M. E. Szebeny, S. M. Gruner (2010). High Pressure Cryocooling at MacCHESS. Amer Cryst. Assoc. 2010 Annual Meeting, Chicago, IL, July 24 -29, 2010.



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- 167d. C. U. Kim, S. M. Gruner (2010). High Pressure Study on Water inside Protein Crystals. IUCr Commission on High Pressure 2010, Park Vista, Gatlinburg, TN, Sept. 19 – 23, 2010.
- 168d. R. M. Baur, D. S. Dale, L. Assoufid, X. Xiao, A. T. Macrander, S. Rutishauser, C. David, S. M. Gruner (2010). Development of a Talbot interferometer at the CHESS F3 beamline. The 10th International Conf. On X-ray Microscopy, Argonne National Laboratory, July 15 – Sept. 15, 2010.
- 169d. H. Philipp, M. Tate, S. Gruner (2011). Single-Photon Thresholding for Low-flux Measurements in Charge-Integrating Pixel Array Detectors. International Workshop on Radiation Imaging Detectors iWoRID, Zurich, Switzerland, July 3 – 7, 2011.
- 170d. B. Barstow, N. Ando, C. U. Kim, S. Gruner (2011). Direct correlation of protein structure and function by high-pressure X-ray crystallography. The 8th International Weber Symposium on Innovative Fluorescence Methodologies in Biochemistry and Medicine, “Weber Symposium”, Kauai, Hawaii, June 12 – 17, 2011.
- 171d. S. M. Gruner (2011). Science at the Hard X-ray Diffraction Limit. Institute of Materials Structure Science Symposium '11, Prospects of Quantum Beam Sciences at IMSS – Strongly Correlated Systems and Future ERL Sciences – EPOCHAL: Tsukuba International Congress Center, Tsukuba, Japan, December 6-7, 2011.
- 172d. D. Agyeman-Budu, A. Woll, K. Finkelstein, D. H. Bilderback, S. Gruner (2012). Microfabricated X-ray Optics at CHESS. CHESS Users' Meeting 2012, Robert Purcell Conf. Center, Cornell Univ., Ithaca, NY, June 5-6, 2012.
- 173d. J. Wierman (2012). A New Reduced Background Crystal Hydration Method for High Pressure Cryocooling. CHESS Users' Meeting 2012, Robert Purcell Conf. Center, Cornell Univ., Ithaca, NY, June 5-6, 2012.
- 174d. R. M. Baur, M. W. Tate, D. S. Dale, S. M. Gruner (2012). A High Spatial Resolution Area Detector with Fiber Optic Scintillator for High-energy X-ray Applications. CHESS Users' Meeting 2012, Robert Purcell Conf. Center, Cornell Univ., Ithaca, NY, June 5-6, 2012.
- 175d. H. T. Philipp, K. S. Green, D. Chamberlain, M. W. Tate, P. Purohit, C. Strohman, S. M. Gruner (2012). Fast, High-dynamic-range, Low-noise, Tiled, Mixed-mode Pixel Array Detector (MMPAD). CHESS Users' Meeting 2012. Robert Purcell Conf. Center, Cornell Univ., Ithaca, NY June 5-6, 2012.
- 176d. M. S. Hromalik, K. S. Green, H. T. Philipp, M. W. Tate, S. M. Gruner (2012). The FPGA Pixel Array Detector. CHESS Users' Meeting 2012. Robert Purcell Conf. Center, Cornell Univ. Ithaca, NY June 5-6, 2012.

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- 177d. C. U. Kim, M. W. Tate, S. M. Gruner (2012). Cryogenic Protein Dynamical Transition. CHESS Users' Meeting 2012. Robert Purcell Conf. Center, Cornell Univ., Ithaca, NY June 5-6, 2012.
- 178d. C. U. Kim, M. W. Tate, S. M. Gruner (2012). Water and Protein Dynamical Transition. CHESS Users' Meeting 2012. Robert Purcell Conf. Center, Cornell Univ. Ithaca, NY June 5-6, 2012.
- 179d. D. B. Zax, C. U. Kim, S. M. Gruner (2012). Probing Weird Phases of Water Via 2H NMR. Cornell High Energy Synchrotron Source (CHESS) and Macromolecular Diffraction Facility at CHESS.
- 180d. D.M. Szebeny, C. U. Kim, M. Cook, S. Gruner, I. Kriksunov, W. Miller, J. Wierman, R. Cerione (2012). Advances in Pressure Cryocooling at MacCHESS. Poster M-81 at American Crystallographic Association Annual Meeting, Boston, MA July 28-August 1, 2012.
- 181d. D. West, C. Kim, C. Tu, J. Gordon, A. Robbins, S. Gruner, D. Silverman, R. McKenna (2012). Structural and Kinetic Effects on Changes of Hydrophobicity in the CO<sub>2</sub> Binding Pocket of Human Carbonic Anhydrase II. Poster M-57 at American Crystallographic Association Annual Meeting, Boston, MA July 28-August 1, 2012.
- 182d. J. Wierman, C. Kim, S. Gruner (2012). A New Technique for Reducing Background Scattering in High Pressure Cryocooling. Poster M-70 at American Crystallographic Association Annual Meeting, Boston, MA July 28-August 1, 2012.
- 183d. C. U. Kim, M. W. Tate, S. M. Gruner (2012). Phase behavior of water and protein dynamics at cryogenic temperatures. 244th American Chemical Society National Meeting & Exposition. Materials for Health & Medicine Philadelphia, PA August 19-23, 2012.
- 184d. K. Giewekemeyer, S. S. Funari, D. J. Vine, K. S. Green, J. Wierman, H. T. Philipp, D. Chamberlain, P. Purohit, M. W. Tate, S. M. Gruner, J. Vila-Comamala, F. Uhlen, D. Nilsson, A. Holmberg, U. Vogt, and A. P. Mancuso (2012). Zone-plate based high-resolution Ptychographic Coherent X-ray Diffractive Imaging at 2-ID-B of the APS. 11th International Conference on X-ray Microscopy, August 5-10, Shanghai, China 2012.
- 185d. M. S. Hromalik, K. S. Green, H. T. Philipp, M. W. Tate, S. M. Gruner (2012). The FPGA Pixel Array Detector. New York Celebration of Women in Computing (NYCWIC) April 19-20, Albany, NY 2013.

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- 186d. C. U. Kim, M. W. Tate, S. M. Gruner (2012). Protein Dynamical Transition at Cryogenic Temperatures. 57th Annual Meeting Biophysical Society February 2-6, Philadelphia, PA 2013. *Biophys. J.*, 104:223A-224A.
- 187d. J. Wierman, J. Alden, C. Kim, P. L. McEuen, S. M. Gruner (2013). Graphene as Protein Crystal Mounting Material to Reduce Background Scatter. 57th Annual Meeting Biophysical Society February 2-6, Philadelphia, PA
- 188d. K. Giewekemeyer, A. Aquila, R. N. Wilke, C. Hackenberg, G. Borchers, A. Zozula, M. Sprung, H. Philipp, R. Jordanova, M. Groves, V. Lamzin, M. Tate, K. Green, S. Gruner, F. Stellato, T. Salditt, A. P. Mancuso (2013). Ptychography of a frozen-hydrated yeast cell in 3 dimensions. 11th International Conference on Biology and Synchrotron Radiation (BSR), Sept. 8 – 11, Grand Elysee Hotel Hamburg, Germany.
- 189d. K. Giewekemeyer, A. Aquila, G. Borchers, R. N. Wilke, T. Salditt, C. Hackenberg, F. Stellato, R. Jordanova, M. Groves, V. Lamzin, H. T. Philipp, M. Tate, S. M. Gruner, A. Zozulya, M. Sprung, A. P. Mancuso (2013). Ptychography of frozen-hydrated biological cells. 22nd International Congress on X-ray Optics and Microanalysis. Sept. 2 – 6, Hamburg, Germany.
- 190d. K. Giewekemeyer, A. Aquila, G. Borchers, H. T. Philipp, S. M. Gruner, R. N. Wilke, T. Salditt, C. Hackenberg, R. Jordanova, M. R. Groves, V. Lamzin, F. Stellato, A. Zozulya, M. Sprung, A. P. Mancuso (2013). Ptychographic Coherent X-ray Diffractive Imaging of yeast cells and their nuclei. European XFEL Users' Meeting 2013-DESY Photon Science User's Meeting, January 23-25, Hamburg, Germany.
- 191d. M. Tate (2013). Integrating Pixel Array Detectors for Both High and Low Fluence Measurements. 17th Pan-American Synchrotron Radiation Instrumentation Conf. SRI2013, June 17-21, Gaithersburg, MD.
- 192d. H. T. Philipp, K. Ayyer, M. W. Tate, V. Elser, S. Gruner (2013). Reconstruction from Randomly Oriented Images Using Extremely Low-fluence Data. 17th Pan-American Synchrotron Radiation Instrumentation Conf. SRI2013, June, 17-21 Gaithersburg, MD.
- 193d. M. S. Hromalik, K. S. Green, H. T. Philipp, M. W. Tate, S. M. Gruner (2013). A Real-Time ACF Implementation for X-Ray Photon Correlation Spectroscopy using The FPGA Pixel Array Detector (2013). 17th Pan-American Synchrotron Radiation Instrumentation Conf. SRI2013, June 17-21, Gaithersburg, MD.
- 194d. H. T. Philipp, M. W. Tate, K. S. Green, J. Weiss, S. Gruner (2013). Improving Pixel Array Detectors Performance Through Data Analysis and Design. 17th Pan-American Synchrotron Radiation Instrumentation Conf. SRI2013, June 17-21, Gaithersburg, MD.

**Sol M. Gruner: Publications**

- 195d. K. S. Green, H. T. Philipp, D. Chamberlain, P. Purohit, M. W. Tate, S. M. Gruner (2013). Area detector development at Cornell. CHESS Users' Meeting, Robert Purcell Conf. Center, June 4-5, Cornell Univ., Ithaca, NY 14853.
- 196d. R. M. Baur, D. S. Dale, S. M. Gruner (2013). Artifacts in grating interferometry data. CHESS users' Meeting, Robert Purcell Conf. Center, June 4-5, Cornell Univ., Ithaca, NY 14853.
- 197d. C. U. Kim, M. W. Tate, S. M. Gruner (2013). Glass-to-liquid Transition of Water at Cryogenic Temperatures. CHESS Users' Meeting, Robert Pucell Conf. Center, Cornell Univ., June 4-5, Ithaca, NY 14853.
- 198d. D. Szebenyi, R. Cerione, M. Cook, R. Gillilan, S. Gruner, Q. Huang, C. U. Kim, I. Kriksunov, T. Lukk, W. Miller (2013). What's Cooking at MacCHESS: Recent Developments at a Synchrotron Source. American Crystallographic Association Annual Meeting, July 20-24, Honolulu, Hawaii.
- 199d. J. Wierman, J. Alden, P. McEuen, S. Gruner (2013). Graphene as a mounting material for protein crystals. American Crystallographic Association Annual Meeting, July 20-24, Honolulu, Hawaii.
- 200d. S. Gruner (2013). Novel Procedures to Obtain Structure from Microcrystals. American Crystallographic Association Annual Meeting, July 20-24, Honolulu, Hawaii.
- 201d. J. Kirchhoff, L. Zhou, M. Zhao, T. P. Weihs, T. c. Hufnagel, D. S. Dale, K. S. Green, H. T. Philipp, M. W. Tate, S. M. Gruner (2013). Millisecond angle-dispersive x-ray reflectivity of Ni/Al multilayers during rapid heating. 2012 MRS Fall Meeting & Exhibit, November 25 -30, Boston, Massachusetts.
- 202d. D. J. Thiel, S. E. Ealick, S. M. Gruner, E. F. Eikenberry (1996). Macromolecular Crystallographic Results Obtained Using the MacCHESS 2k x 2k CCD Detector. CHESS Users' Meeting, June 18 – 19, Cornell University, Ithaca, NY.
- 203d. E. J. Prenner, R. N. A. H. Lewis, R. N. McElhaney, L. H. Kondejewski, R. S. Hodges, K. C., Neuman, S. M. Gruner (1997). Cubic Phases Induced Upon Interaction of Gramicidin with Lipid Bilayers – A Clue to Its Mechanism of Action? Biophysical Society 41st Annual Mtg. March 2-6, 1997 Ernest N. Morial Convention Center New Orleans, Louisiana. *Biophysical Journal* 72:2, Part 2, A191.
- 204d. K. S. Shanks, H. T. Philipp, M. T. Tate, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner (2014). Time-Resolved and Wide Dynamic Range Experiments with the Mixed-Mode Pixel Array Detector. Cornell High Energy Synchrotron Source 2014 Users Meeting, Ithaca, NY, June 10-11, 2014.

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- 205d. H. T. Philipp, M. W. Tate, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner (2014). High-Speed Imaging and Bunch Train Isolation with the KECK Pixel Array Detector. Cornell High Energy Synchrotron Source 2014 Users Meeting, Ithaca, NY, June 10-11, 2014.
- 206d. K. Ayyer, H. Philipp, M. Tate, V. Elser, S. Gruner (2014). Serial crystallography at synchrotron sources: Data Analysis. Cornell High Energy Synchrotron Source 2014 Users Meeting, Ithaca, NY, June 10-11, 2014.
- 207d. K. Ayyer, H. T. Philipp, M. W. Tate, V. Elser, S. M. Gruner (2014). Serial crystallography with sparse data: collective orienting and indexing. American Crystallographic Association annual meeting, Albuquerque, NM, May 24-28, 2014.
- 208d. J. Wierman, J. Alden, P. McEuen, S. Gruner (2014). Bringing back room temperature crystallography: new techniques and methods. American Crystallographic Association annual meeting, Albuquerque, NM, May 24-28, 2014.
- 209d. S. Fraden, S. Gruner, A. Ophalage, M. Heymann, J. Wierman (2014). Serial Crystallography. American Crystallographic Association annual meeting, Albuquerque, NM, May 24-28, 2014.
- 210d. K. S. Shanks, H. T. Philipp, M. W. Tate, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner (2014). Photon-integrating Pixel Array Detectors for Time-resolved and High Dynamic Range Experiments. 2014 Users Meeting User Science: discoveries for tomorrow. Argonne National Laboratory, Lemont, IL, May 12-15, 2014.
- 211d. J. L. Wierman, M. Szebeny, S. M. Gruner (2014). Unit cell shift in thaumatin crystals within graphene at ambient conditions. 2014 CHESS Users Meeting, Cornell University, Ithaca, NY, June 10-11, 2014.
- 212d. H. Philipp, K. Shanks, M. Tate, J. Weiss, S. Gruner (2014). Fast and Wide Dynamic Range X-ray Detectors Enable Novel Science. 23<sup>rd</sup> Congress and General Assembly of the International Union of Crystallography, Montreal, Quebec, Canada, August 5-12, 2014.
- 213d. S. Gruner (2014). Crystallographic Studies of Proteins Under High Pressure Conditions. 23<sup>rd</sup> Congress and General Assembly of the International Union of Crystallography, Montreal, Quebec, Canada, August 5-12, 2014.
- 214d. H. T. Philipp, M. W. Tate, K. S. Shanks, J. T. Weiss, P. Purohit, S. M. Gruner (2014). Cornell Integrating Pixel Array Detector Development for synchrotron X-ray Light Sources. International Workshop on Semiconductor Pixel Detectors for Particles and Imaging (PIXEL2014), Niagara Falls, Canada, September 1-5, 2014.

**Sol M. Gruner: Publications**

- 215d. K. S. Shanks, H. T. Philipp, M. W. Tate, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner (2014). Medium-Format Photon-Integrating Pixel Array Detectors for Time-Resolved and High Dynamic Range Experiments. International Workshop on Radiation Imaging Detectors (iWoRID) 2014. June 22-26, 2014. Trieste, Italy
- 216d. M. Heymann, A. Ophthalage, J. L., Wierman, S. Akella, S. M. Gruner, S. Fraden. Serial crystallography using a kinetically optimized microfluidic device for protein crystallization and on-chip X-ray diffraction. 15<sup>th</sup> International Conference on the Crystallization of Biological Macromolecules. September 17-20, 2014 Hamburg, Germany.
- 217d. Caleb Hustedt, Paul Lambert, Emily Huskins, Daniel Casem, Vignesh Kannan, K. T. Ramesh, Sol Gruner, Mark Tate, Hugh Philip, Arthur Woll, Mantong Zhao, Alexander Ananiadis, Prafull Purohit, Joel Weiss, Todd Hufnagel. Sub-Microsecond In-Situ X-Ray Diffraction of Bulk Polycrystalline Metals under Dynamic Compression. Program Symposium TT: Advanced Materials Exploration with Neutrons and X-Rays-The State-of-the-Art in the International year of Crystallography. November 30-December 5, 2014 Boston, MA.
- 218d. K. Ayer, H. T. Philipp, M. W. Tate, J. L. Wierman, V. Elser, S. M. Gruner. Homeopathic Imaging: what happens when we look at really small objects. International Workshop on Phase Retrieval and Coherent Scattering Coherence. 2014 Program Norris Center, Northwestern Univ., 199 Campus Drive, Evanston, IL, September 2-5, 2014 Evanston, IL.
- 219d. K. Giewekemeyer, C. H. Yoon, A. Aquila, G. J. Williams, H. T. Philipp, M. W. Tate, K. S. Shanks, J. T. Weiss, S. M. Gruner, D. J. Vine, C. Chang, R. Tiberio, A. Sakdinawat, N. D. Loh, A. P. Mancuso. Towards experimental 3D Coherent Diffraction Imaging from a large series of noisy diffraction patterns. International Workshop on Phase Retrieval and Coherent Scattering. Coherence 2014 Program Norris Center, Northwestern Univ., 199 Campus Drive, Evanston, IL, September 2-5, 2014 Evanston, IL.
- 220d. T. Y. Lan, J. L. Wierman, M. W. Tate, H. T. Philipp, V. Elser, S. M. Gruner. Potential Application of Expand-Maximize-Compress (EMC) Algorithm on Synchrotron-based Serial Crystallography. 2015 CHESS Users' Meeting, 120 PSB Cornell Univ., June 9-10, 2015 Ithaca, N.Y.
- 221d. H. T. Philipp, M. W. Tate, P. Purohit, D. Chamberlain, K. S. Shanks, J. T. Weiss, S. M. Gruner. "High-Speed X-ray Imaging Pixel Array Detector (Keck-PAD) for Time-Resolved Experiments at Synchrotron Sources". 2015 CHESS Users' Meeting, 120 PSB Cornell Univ., June 9-10, 2015 Ithaca, N.Y.

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- 222d. V. Pillar, D. Schuller, M. Szebenyi, M. Wall, J. Wierman, S. Gruner. “Reproducibility of Diffuse X-ray Scatter in Lysozyme Crystals”. 2015 CHESS Users’ Meeting, 120 PSB Cornell Univ., June 9-10, 2015 Ithaca, N.Y.
- 223d. K. Shanks (representing the Gruner Detector Group). “Introduction to fast-framing detectors”. Invited talk to the 2015 CHESS Users’ Meeting, 120 PSB Cornell Univ., June 9-10, 2015 Ithaca, N.Y.
- 224d. J. L. Wierman, T. Y. Lan, M. W. Tate, H. T. Philipp, V. Elser, S. M. Gruner. “Recovering protein crystal orientation and reconstructing structure factors from sparse data frames”. 2015 CHESS Users’ Meeting, 120 PSB Cornell Univ., June 9-10, 2015 Ithaca, N.Y.
- 225d. C. J. Hustedt, P. K. Lambert, E. L. Huskins, D. T. Casem, S. M. Gruner, M. W. Tate, H. T. Philip, A. R. Woll, P. Purohit, J. T. Weiss, V. Kannan, K. T., Ramesh, M. Zhao, A. Ananiadis, T. C. Hufnagel. Sub-Microsecond In-Situ X-ray Diffraction of Polycrystalline Metals Under Dynamic Compression. 2015 Sem Annual Conf. & Exposition on Experimental & Applied Mechanics, June 7 – 11, 2015 Costa Mesa, CA.
- 226d. K. X. Nguyen, R. Hovden, M. W. Tate, P. Purohit, J. Heron, C. Chang, S. M. Gruner, D. A. Muller. Lorentz-STEM imaging of Fields and Domains using a High-Speed, High-Dynamic Range Pixel Array Detector at Atomic Resolution. 2015 M&M Microscopy & Microanalysis, August 2 – 6, 2015 Portland, OR. Also listed herein as paper #320. Published in *Microscopy & Microanalysis* **21**: 2309-2310 (Suppl. 3), Paper No. 1153, doi:10.1017/S1431927615012325.
- 227d. P. Purohit, M. W. Tate, D. Chamberlain, K. X. Nguyen, R. Hovden, D. A. Muller, S. M. Gruner. High-Speed, High Dynamic Range diffractive Imaging Camera for Scanning Transmission Electron Microscopy. 2015 M&M Microscopy & Microanalysis, August 2 – 6, 2015 Portland, OR.
- 228d. J. Wierman, T. Lan, M. Tate, H. Philipp, V. Elser, S. Gruner. Recovering protein crystal orientation from “unindexible” data frames. 65<sup>th</sup> Annual Meeting, American Crystallographic Association, July 25 – 29, 2015 Philadelphia, PA.
- 229d. T. Lan, J. Wierman, M. Tate, H. Philipp, V. Elser, S. Gruner. Potential Application of Expand-Maximize-Compress (EMC) Algorithm on Synchrotron-based Serial Crystallography. 65<sup>th</sup> Annual Meeting, American Crystallographic Association, July 25 – 29, 2015 Philadelphia, PA.
- 230d. J. T. Weiss, K. S. Shanks, H. T. Philipp, J. Becker, M. W. Tate, S. M. Gruner. Design of the High Dynamic Range Pixel Array Detector (HDR-PAD). 2015 IEEE Nuclear

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Science Symposium & Medical Imaging Conference, October 31 – November 7, 2015  
San Diego, CA.

- 231d. J. Becker, J. T. Weiss, K. S. Shanks, H. T. Philipp, M. W. Tate, S. M. Gruner. Beneficial Effects of Electron-Hole Plasmas Created in Silicon Sensors by XFEL-like High Intensity Pulses for X-Ray Detectors. 2015 IEEE Nuclear Science Symposium & Medical Imaging Conference, October 31 – November 7, 2015 San Diego, CA.
- 232d. M. W. Tate, K. S. Shanks, H. T. Philipp, J. Becker, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner. CdTe Sensors Used in Charge-Integrating Pixel Array Detectors for High-Speed Imaging. 2015 IEEE Nuclear Science Symposium & Medical Imaging Conference, October 31 – November 7, 2015 San Diego, CA.
- 233d. K. Nguyen, R. Hovden, M. W. Tate, E. Turgut, P. Purohit, D. Chen, J. Heron, C. Chang, R. Ramesh, G. D. Fuchs, S. M. Gruner, D. Muller. Imaging Fields and Domains of Multiferroic Oxides Using Lorentz Scanning Transmission Electron Microscopy. 2015 MRS Fall Meeting & Exhibit, Nov. 29 – Dec. 4, 2015 Boston, MA.
- 234d. T. C. Hufnagel, K. R. Overdeep, H. Joress, L. Zhou, K. J. T. Livi, D. S. Dale, M. W. Tate, H. T. Philipp, K. S. Shanks, J. T. Weiss, S. M. Gruner, T. P. Weihs. In Situ X-Ray Diffraction Studies of Combustion of Al/Zr Reactive Nanolaminate Foils. 2015 MRS Fall Meeting & Exhibit, Nov. 29 – Dec. 4, 2015 Boston, MA.
- 235d. K. Giewekemeyer, A. Aquila, N. D. Loh, K. S. Shanks, J. Weiss, M. W. Tate, H. T. Philipp, S. Stern, P. Vagovic, C. H., Yoon, M. Mehrjoo, Y. Chushkin, F. Zontone, D. J. Vine, R. Harder, C. Chang, R. Tiberio, A. Sakdinawat, G. J. Williams, A. P. Mancuso. Toward 3D Single Particle Imaging using a model, non-crystalline system with weak 3D diffraction data. BioXFEL STC 3<sup>rd</sup> Annual International Conference, January 13<sup>th</sup>-15<sup>th</sup>, 2016 San Juan, PR.
- 236d. K. Giewekemeyer, A. Aquila, N. D. Loh, K. Shanks, J. Weiss, M. Tate, H. T. Philipp, S. Stern, P. Vagovic, C. Yoon, M. Mehrjoo, Y. Chushkin, F. Zontone, D. Vine, R. Harder, C. Chang, R. Tiberio, A. Sakdi-nawat, S. M. Gruner, G. Williams, A. P. Mancuso. Towards 3D Single Particle Imaging using a model, non-crystalline system with weak 3D diffraction data. European XFEL Users' Meeting 2016 & DESY Photon Science Users' Meeting 2016, January 27-29, 2016, DESY, Hamburg, Germany
- 237d. J. L. Wierman, T. Y. Lan, M. W. Tate, H. T. Philipp, V. Elser, S. M. Gruner. Recovering Protein Crystal Orientation from Sparse, "Unindexible" Data Frames. Advanced Photon Source Users Meeting 2016 APS/CNM Users. May, 9-12, 2016, Argonne National Laboratory, Argonne, IL.
- 238d. T. C. Hufnagel, K R. Overdeep, H. Joress, L. Zhou, K. J. T. Livi, D. S. Dale, M. W. Tate, H. T. Philipp, K. S. Shanks, J. T. Weiss, S. M. Gruner, T. P. Weihs. In Situ X-



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- Ray Diffraction Studies of combustion of Al/Zr Reactive Nanolaminate Foils. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120PSB, Ithaca, NY.
- 239d. P. Beaucage, S. Robbins, J. P. Sethna, F. J. DiSalvo, R. B. VanDover, S. M. Gruner, U. Wiesner. Block Copolymer Self-Assembly-Derived Synthesis of Mesoporous Gyroidal Superconductors. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120PSB, Ithaca, NY.
- 240d. J. Becker, M. W. Tate, K. S. Shanks, H. T. Philipp, J. T. Weiss, P. Purohit, C. Chamberlain, S. M. Gruner. Overcoming the limitations of silicon: First results from MM-PAD and Keck-PAD with CdTe sensors for experiments at up to 100 keV and beyond. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120PSB, Ithaca, NY.
- 241d. G. Illava, J. Wierman, R. Gillilan, S. M. Gruner. Quest for Ultra Strong Multilayer Graphene as X-ray Transparent SAXS/WAXS Window and Protein Crystal Wrapping material. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120 PSB, Ithaca, NY.
- 242d. C. U. Kim, H. song, B. S. Avvaru, S. M. Gruner, S. Y. Park, R. McKenna. Tracking intermediate states of carbonic anhydrase during CO<sub>2</sub> release. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120 PSB, Ithaca, NY.
- 243d. P. Purohit, M. W. Tate, K. X. Nguyen, D. Chamberlain, D. A. Muller, S. M. Gruner. High-Speed, High Dynamic Range Pixel Array Detector for Scanning Transmission Electron Microscopy. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120PSB, Ithaca, NY.
- 244d. K. S. Shanks, H. T. Philipp, J. T. Weiss, J. Becker, M. W. Tate, P. Purohit, D. Chamberlain, S. M. Gruner. The Mixed-Mode Pixel Array Detector Family. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120 PSB, Ithaca, NY.
- 245d. J. L. Wierman, M. Cook, R. Huang, S. M. Gruner. X-ray Capillary Beamline Improvements for Serial Microcrystallography at CHESS. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120 PSB, Ithaca, NY.
- 246d. J. T. Weiss, K. S. Shanks, H. T. Philipp, P. Purohit, D. Chamberlain, J. Becker, M. W. Tate, S. M. Gruner. Dynamic Range Extension Techniques for the HDR-PAD. 2016 CHESS Users' Meeting, June 7-8, 2016 Cornell Univ., 120 PSB, Ithaca, NY.
- 247d. H. T. Philipp, M. W. Tate, K. S. Shanks, J. T. Weiss, J. Becker, P. Purohit, D. Chamberlain, S. M. Gruner. New Detectors for New (and Existing) Light Sources. NSLS-II & CFN Joint Users' Meeting, May 23-25, 2016 Brookhaven National Laboratory, Upton, NY.

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- 248d. J. Becker, K. S. Shanks, H. T. Philipp, M. W. Tate, J. T. Weiss, P. Purohit, D. Chamberlain, S. M. Gruner. Detecting high energy photons: First results from an MM-PADD detector with GaAs sensor. 2017 CHESS User Meeting, Cornell University, Ithaca, NY.
- 249d. G. Illava, K. Jenkins, H. Balasubramanian, D. Barrick, S. Klein, R. Winter, C. Royer, S. M. Gruner. High-pressure Small Angle X-ray Scattering of Biological Molecules. 2017 CHESS User Meeting, Cornell University, Ithaca, NY.
- 250d. J. L. Wierman, A. Finke, M. J. Cook, O. Pare-Labrosse, J. Besaw, A., Sarracini, D. Miller, S. M. Gruner. Cutting edge SMX at MacCHESS: Room temperature serial crystallography with oscillating fixed targets and fast-framing detectors on a micro-focused x-ray beam. 2017 CHESS User Meeting, Cornell University, Ithaca, NY.
- 251d. H. T. Philipp, M. W. Tate, K. Chatterjee, A. J. Beaudoin, S. M. Gruner. Time-Resolved Hard X-ray 3-D Imaging of Reciprocal Space for Material Science using the CdTe Mixed-Mode Pixel Array Detector (MM-PAD). 2017 CHESS User Meeting, Cornell University, Ithaca, NY.
- 252d. B. C. Chan, J. A. Farrington, S. M. Gruner, B. Martin, H. T. Philipp, P. Purohit, K. S. Shanks, M. W. Tate. Development of Fast-framing Hybridized X-ray Imaging Detector for “single shot” Experiments. 2018 Advanced Photon Source/Center for Nanoscale Materials Users Meeting. Argonne National Laboratory, Lemont, IL, May 7-10, 2018.
- 253d. K. Chatterjee, A.J. Beaudoin, J.Y.P. Ko, H.Philipp, P. Pusrohit, S.M. Gruner. Study of residual stresses in Ti-7Al using theory and experiments. 18<sup>th</sup> International Conference on Textures of Materials. St. George, Utah, USA. 5-10 November 2017.
- 254d. K. Giewekemeyer, A. Aquila, N.D. Loh, Y. Chushkin, K.S. Shanks, J. Weiss, M.W. Tate, H.T. Philipp, S. Stern, P. Vagovic, C.H. Yoon, M. Mehrjoo, F. Zontone, D.J. Vine, R. Harder, C. Chang, R. Tiberio, A. Sakdinawat, S.M. Gruner, G.J. Williams, A.P. Mancuso. Experimental 3D Coherent Diffractive Imaging from Photon-Sparse Random Projections. 2016 International Conference X-Ray Microscopy, Univ. of Oxford, UK, August 15-19, 2016.
- 255d. P. Beaucage, S. Robbins, J.P. Sethna, F.J. DiSalvo, R.B. Van Dover, S.M. Gruner, U. Wiesner. Gyroidal Mesoporous Niobium Nitride Superconductors from Block Copolymer Self-Assembly. 2017 APS March Meeting, Ernest Morial Convention Center, New Orleans, LA, March 13-17, 2017
- 256d. P. Beaucage, S. Robbins, J. Sethna, F.J. DiSalvo, R.B. Van Dover, S.M. Gruner, U. Wiesner. From Nano- to Meso-Scale Order in Block Copolymer Self-Assembly-

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- Derived Gyroidal Mesoporous Niobium Nitride, 2017 APS March Meeting, Ernest Morial Convention Center, New Orleans, LA, March 13-17, 2017
- 257d. D. Rai, C. Royer, S. Gruner. Investigating pressure denaturation using the high pressure small angle x-ray scattering. 2018 APS March Meeting, Los Angeles, CA, March 5-9, 2018.
- 258d. P. Beaucage, S. Gruner, U. Wiesner. Elucidating Reaction Pathways in the Synthesis of Block Copolymer-Derived Crystalline Inorganic Materials via In Situ SAXS/WAXS and XAS. 2018 APS March Meeting, Los Angeles, CA, March 5-9, 2018.
- 259d. P. Beaucage, S. Gruner, U. Wiesner. Synthesis of Chiral Three-Dimensionally Ordered Mesoporous Superconducting Niobium Nitride Gyroids using Block Copolymer Self-Assembly. 2018 APS March Meeting, Los Angeles, CA, March 5-9, 2018.
- 260d. P. Beaucage, S. Gruner, U. Wiesner. Synthetic Pathways to ABA and ABC Triblock Copolymer Derived Ordered Mesoporous Niobium Nitrides. 2018 APS March Meeting, Los Angeles, CA, March 5-9, 2018.
- 261d. T.Y. Lan, J.L. Wierman, M.W. Tate, H.T. Philipp, V. Elser, S.M. Gruner. Reconstructing 3D protein crystal intensity from unoriented sparse diffraction patterns. 2018 Workshop on Computational Methods in Bio-imaging Sciences, Singapore January 8-12, 2018.
- 262d. K. Giewekemeyer, A. Aquila, N.D. Loh, Y. Chushkin, K.S. Shanks, J. Weiss, M.W. Tate, H.T. Philipp, S. Stern, P. Vagovic, M. Mehrjoo, F. Zontone, C. Chang, A. Sakdinawat, S. M. Gruner, G.J. Williams, A.P. Mancuso. 1082 Workshop on Computational Methods in Bio-imaging Sciences, Singapore, January 8-12, 2018.
- 263d. K.S. Shanks, M.W. Tate, H.T. Philipp, J.T. Weiss, J. Becker, P. Purohit, D. Chamberlain, S.M. Gruner. Designs for High Dynamic Range Pixel Array Detectors for XFEL and Fast-Bunch Imaging. 2016 High-energy and Ultrafast X-Ray Imaging Technologies and Applications, Los Alamos National Laboratory, Santa Fe at Buffalo Thunder, August 2-3, 2016.
- 264d. M.W. Tate, K.S. Shanks, H.T. Philipp, J.T. Weiss, J. Becker, P. Purohit, D. Chamberlain, S.M. Gruner. CdTe Sensors on Charge-Intergrating Pixel Array Detectors for High-Speed X-ray Imaging, 2016 High-energy and Ultrafast X-Ray Imaging Technologies and Applications, Los Alamos National Laboratory, Santa Fe at Buffalo Thunder, August 2-3, 2016.
- 265d.



## Sol M. Gruner: Publications

**e. Group Publications (for which SMG is not a coauthor)**

- 1e. G.T. Reynolds (1990). Lyoluminescence. Tech. Report #3, DOE Contract DE-FG02-87ER60522-A000. (Dept. of Physics, Princeton University, Princeton, NJ 08544).
- 2e. M.W. Tate (1991). CCD based x-ray detectors. *Adv. in X-ray Analysis* 34: 357-362.
- 3e. L.M. Zeger (1989). The study of the  $L_{\alpha}$  -  $H_{II}$  phase transition using monodomains. (Senior Thesis, Dept. of Physics, Princeton University).
- 4e. J.P. O'Brien (1989). A new method of mapping the temperature-water chemical potential phase diagram of phospholipids. (Senior Thesis, Dept. of Physics, Princeton University).
- 5e. J.A. Cerne (1990). High pressure studies using a diamond anvil cell. (Senior Thesis, Dept. of Physics, Princeton University).
- 6e. Joseph W. Strzalka (1991). Design and characterization of a capacitance-based dilatometer prototype (Senior Thesis, Princeton Elec. Engineering Dept.).
- 7e. Yumi Ijiri (1991). Studies on charged phospholipid-water phase behavior. (Senior Thesis, Dept. of Physics, Princeton University).
- 8e. George T. Reynolds (1991). Image intensification with color capability. *Appl. Optics* 30: 1366-1368.
- 9e. A.D. Polcyn (1992). A study of the effect of negative pressure on the  $H_{II}$  phase of the DOPE/Water system. (Senior thesis, Dept. of Physics, Princeton University).
- 10e. G.T. Reynolds (1992). Lyoluminescence. *J. Luminescence* 54: 43-69.
- 11e. Geo. T. Reynolds (1989). Thirty years of (image) intensified physics and biology, *SPIE* 1161: 104-124.
- 12e. D.A. Hajduk and G.T. Reynolds (1992). Luminescence from polymerization of acrylamide (abst.). *Bull. Amer. Soc.* 37: 510.
- 13e. J. A. Barry, H. Lamparski, E. Shyamsunder, F. Osterberg, J. Cerne, M. F. Brown and D. F. O'Brien (1992).  $^{31}\text{P}$  NMR and x-ray diffraction study of the effect of photopolymerization on lipid polymorphism. *Biochem.* 31: 10114-10120.

**Sol M. Gruner: Publications**

- 14e. G. T. Reynolds (1993). Sources of low level light emission in laboratory and sea water. Tech. Report #5, DOE Contract DE-FG02-87ER60522-A000. (Dept. of Physics, Princeton University, Princeton, NJ 08544).
- 15e. E.F. Eikenberry, F. Osterberg, T.C. Irving, G. Cecchi, M.A. Bagni, C.C. Ashley and P.J. Griffiths (1994). Direct recording of time-resolved x-ray diffraction during tetanus rise of single muscle fibers using a CCD area detector (abstract). *Biophys. J.* 66: A191.
- 16e. E.F. Eikenberry, F. Osterberg, T.C. Irving, G. Cecchi, M.A. Bagni, C.C. Ashley and P.J. Griffiths (1995). Millisecond time-resolved lattice spacing measurements accompanying length changes during tetani in single muscle fibers (abstract). *Biophys. J.* 68: A68.
- 17e. M.D. McGehee (1994). Self-assembling mesoscopic surfactant/silicate materials. (Senior thesis, Dept. of Physics, Princeton University).
- 18e. Y-N Jun (1994). Magnetophoresis. (Senior thesis, Dept. of Physics, Princeton University.)
- 19e. Reynolds (1995). Life and light at hydrothermal vents. (Technical Report 6, DOE Grant DE-FG02-87ER60522-A000.)
- 20e. Y. Han (1995). Pressure and pH induced unfolding of staphylococcal nuclease. (Senior thesis. Dept. of Physics, Princeton University.)
- 21e. C.L. Van Dover, G.T. Reynolds, A.D. Chave, J.A. Tyson (1996). Light at deep-sea hydrothermal vents. *Geophysical Research Letters* 23 (16): 2049-2052.
- 22e. G.T. Reynolds (1997). Piezoluminescence from a ferroelectric polymer and quartz. (Technical Report 7, DOE Grant DE-FG02-87ER60522).
- 23e. J.D. Enlow, R.L. Enlow, K.M. McGrath, M.W. Tate (2004). Modeling liquid crystal bilayer structures with minimal surfaces. *Journal of Chemical Physics* 120 (4): 1981-1989.
- 24e. Mark W. Tate (2007). Recent advances in x-ray pixel detectors. (abstract) The 2007 Meeting of the American Crystallographic Association, Salt Lake City, Utah, July 21-26, 2007.
- 25e. J. Zhao, J. Wu, F. A. Heberle, T. T. Mills, P. Klawitter, G. Huang, G. Costanza, G. W. Feigenson (2007). Phase studies of model biomembranes: Complex behavior of DSPC/DOPC/Cholesterol. *Biochimica et Biophysica Acta* 1768: 2764-2776.

**Sol M. Gruner: Publications**

- 26e. T. T. Mills, G. E. S. Toombes, S. Tristram-Nagle, D. M. Smilgies, G. W. Feigenson, J. F. Nagle (2008). Order Parameters and Areas in Fluid-Phase Oriented Lipid Membranes Using Wide Angle X-ray Scattering. *Biophysical Journal* 95 : 669-681.
- 27e. T. T. Mills, S. Tristram-Nagle, F. A. Heberle, N. F. Morales, J. Zhao, J. Wu, G. E. S., Toombes, J. F. Nagle, G. W. Feigenson (2008). Liquid-Liquid Domains in Bilayers Detected by Wide Angle X-ray Scattering. *Biophysical Journal*. 95 : 682-690.
- 28e. Edward J. W. Crossland, Marleen Kamperman, Mihaela Nedelcu, Caterina Ducati, Ulrich Wiesner, Detlef -M. Smilgies, Gilman E. S. Toombes, Marc A. Hillmyer, Sabine Ludwigs, Ullrich Steiner, and Henry J. Snaith (2009). A Bicontinuous Double Gyroid Hybrid Solar Cell. *Nano Letters*. 9: 2807-2812. (DOI: 10.1021/nl803174p).
- 29e. David Pennicard, Julian Becker, and Milija Sarajlic (2018). LAMDA Detector – An Example of a State-of-the-Art Photon Counting Imaging System. Chapter 3 in *Semiconductor Radiation Detectors, Technology and Applications*, Salim Reza, Ed. (CRC Press, Boca Raton, Florida 33487-2742). ISBN 13: 978-1-138-71034-4.
- 30e. Ti-Yen Lan (2018). Orientation reconstruction algorithms for x-ray serial diffraction data. Ph.D Thesis, Field of Physics. Cornell University, Ithaca, NY.

**Sol M. Gruner: Publications*****f. PhD Theses Supervised***

- 1f. D.T. Barry (1979). Correlated x-ray diffraction analysis and electron microscopy of photoreceptor membranes (Princeton University, Dept. of Electrical Engineering & Computer Science).
- 2f. D.L. May (1982). Diamagnetic anisotropy as a structural probe for biological and synthetic polymers (Princeton University, Physics Dept.).
- 3f. B. Collett (1983). The passive mechanics of muscle: a preliminary structural study (supervised with Prof. J. Milch) (Princeton University, Physics Dept.).
- 4f. G. Kirk (1984). Thermodynamic models and experimental investigations of the lamellar ( $L\alpha$ ) to inverse hexagonal ( $H_{II}$ ) phase transition of lipid-water systems (Princeton University, Physics Dept.).
- 5f. D. Weise (1985). A panorama of uses for diamagnetic anisotropy in polymer science (Princeton University, Physics Dept.).
- 6f. M.W. Tate (1987). Equilibrium and kinetic states of the  $L\alpha - H_{II}$  transition (Princeton University, Physics Dept.).
- 7f. D.C. Turner (1990). Structural investigations of the inverted hexagonal and inverted cubic phases in lipid-water systems (Princeton University, Physics Dept.).
- 8f. P.T.C. So (1992). High pressure effects on the mesophases of lipid-water systems (Princeton University, Physics Dept.).
- 9f. D.A. Hajduk (1994). Morphological Transitions in Block Copolymers (Princeton University, Physics Dept.).
- 10f. S.L. Keller (1995). Voltage-Clamp and X-ray Diffraction Studies of Alamethicin: A Window into Lipid-Protein Interactions (Princeton University, Physics Dept.).
- 11f. M.E. Wall (1996). Diffuse features in x-ray diffraction from protein crystals (Princeton University, Physics Dept.).
- 12f. F.H.O. Osterberg (1996). Induced changes in the diffuse x-ray scattering background from protein crystals (Princeton University, Physics Dept.).
- 13f. P.E. Harper (1996). Structural studies of surfactant and polymer systems (Princeton University, Physics Dept.).



**Sol M. Gruner: Publications**

- 14f. S.L. Barna (1996). Development of a microsecond framing two-dimensional pixel array detector (PAD) for time-resolved x-ray diffraction (Princeton University, Physics Dept.).
- 15f. P.K. Urayama (2001). Techniques for high pressure macromolecular crystallography and the effects of pressure on the structure of sperm whale myoglobin (Princeton University, Physics Dept.).
- 16f. X. Li (2003). Studies of block copolymers in surface science and engineering nanotechnology (Cornell University, Dept. of Materials Science & Engineering). Co-advised with Prof. C. Ober.
- 17f. M.J. Renzi (2003). Pixel Array Detectors for ultra-fast time-resolved x-ray imaging. (Cornell University, School of Engineering & Applied Physics).
- 18f. A. Jain (2004). Self- and Co-Assembly of Polymer and Nanoparticle Building Blocks into Nanostructured Materials. (Cornell University, Dept. of Materials Science & Engineering). Co-advised with Prof. Uli Wiesner.
- 19f. M.D. Collins (2006). High-pressure x-ray crystallography and core hydrophobicity of T4 lysozymes. (Cornell University, Department of Physics).
- 20f. Qun Liu (2006). Structural studies of two enzymes and the method development for low resolution molecular replacement. (Primarily advised by Dr. Quan Hao; administratively advised only by Sol Gruner. Biophysics Field, Cornell University).
- 21f. Alper Ercan (2007). Development of a high frame rate x-ray imager. (Cornell University, School of Applied and Engineering Physics)
- 22f. Gilman Ewan Stephen Toombes (2007). Structural studies of block copolymer and block copolymer/aluminosilicate materials. (Cornell University, Department of Physics)
- 23f. Chae Un Kim (2007). High pressure cryocooling for macromolecular crystallography. (Cornell University, Field of Biophysics)
- 24f. Sterling Cornaby (2007). (Primarily advised by Dr. Don Bilderback; administratively advised only by Sol Gruner. Cornell University, Field of Applied Physics)
- 25f. Dan Schuette (2008). A mixed analog and digital pixel array detector for synchrotron x-ray imaging. (Cornell University, Dept. of Physics)
- 26f. Nozomi Ando (2008). Biomolecules under high hydrostatic pressure. (Cornell University, Field of Physics)

**Sol M. Gruner: Publications**

- 27f. Buz Barstow (2009). Direct correlation of protein structure and function using high-pressure x-ray crystallography. (Cornell University, Field of Applied Physics)
- 28f. Lucas Koerner (2010). X-ray analog pixel array detector for single synchrotron bunch time-resolved imaging. (Cornell University, Department of Physics)
- 29f. Yi-Fan Chen (2012). Phase behavior of cardiolipin. (Cornell University, Field of Biophysics)
- 30f. Hiroki Sai (2013). Structural complexities in synthetic self-assembling nanomaterials. (Materials Science & Engineering Field, co-advised with Uli Wiesner)
- 31f. Robin Baur (2013). Development and application of a grating interferometer at the Cornell High Energy Synchrotron Source. (Cornell University, Field of Physics)
- 32f. Katharine Sato Shanks (2014). Development of low-noise direct-conversion x-ray area detectors for protein crystallography. (Cornell University, Field of Physics)
- 33f. Jennifer L. Wierman (2017). Exploration of methods for serial crystallography at storage ring x-ray sources. (Cornell University, Field of Biophysics)
- 34f. Joel Weiss (2017). Development of a high dynamic range pixel array detector for synchrotrons and XFELs. (Cornell University, Field of Physics)
- 35f. Peter Beaucage (In process; Materials Science & Engineering Field, co-advised with Uli Wiesner)

**Sol M. Gruner: Publications*****g. Post-Docs & Research Associates Supervised (year started)***

|      |                                      |        |
|------|--------------------------------------|--------|
| 1g.  | Richard Templer                      | (1986) |
| 2g.  | Erramilli Shyamsunder                | (1986) |
| 3g.  | Mark Tate                            | (1987) |
| 4g.  | Manfred Kriechbaum                   | (1991) |
| 5g.  | James Gleeson                        | (1991) |
| 6g.  | John Shepherd                        | (1993) |
| 7g.  | Devora Perahia                       | (1995) |
| 8g.  | Kate McGrath                         | (1995) |
| 9g.  | Lois Pollack                         | (1997) |
| 10g. | Guiseppe Rossi                       | (1997) |
| 11g. | Achim Zirkel                         | (1997) |
| 12g. | Karen Edler                          | (1997) |
| 13g. | Adam Finnefrock                      | (1998) |
| 14g. | Ivan Bazarov (W Prof. Maury Tigner)  | (2000) |
| 15g. | Peter Abbamonte                      | (2001) |
| 16g. | Jochen Gutmann (w/Prof. Uli Wiesner) | (2001) |
| 17g. | Pascale Chenevier                    | (2002) |
| 18g. | Hugh Philipp                         | (2004) |
| 19g. | Peter Busch (w/Prof. Chris Ober)     | (2004) |
| 20g. | Marianne Hromalik (nee Pouchet)      | (2005) |
| 21g. | Chae Un Kim                          | (2007) |
| 22g. | Suntao Wang                          | (2009) |
| 23g. | Katharine Sato Shanks                | (2014) |
| 24g. | Julian Becker                        | (2014) |
| 25g. | Jennifer Wierman                     | (2017) |
| 26g. | Durgesh Rai                          | (2017) |

**Sol M. Gruner: Publications*****h. Patents***

- 1h. Sol M. Gruner & Gregory Kirk, Encapsulated scintillators for measuring the concentration of tritiated solutes. US Pat. 4588698 - Filed Oct 19, 1982.
- 2h. Robert P. Lenk, Michael W. Fountain, Andrew S. Janoff, Mircea C. Popescu, Steven J. Weiss, Richard S. Ginsgurg, Marc J. Ostro & Sol M. Gruner, Stable plurilamellar vesicles. US Pat. 5030453 - Filed Oct 12, 1984.
- 3h. Robert P. Lenk, Michael W. Fountain, Andrew S. Janoff, Mircea C. Popescu, Steven J. Weiss, Richard S. Ginsgurg, Marc J. Ostro & Sol M. Gruner, Stable plurilamellar vesicles. US Pat. 5169637 - Filed Apr 2, 1991.
- 4h. Kathryn M. McGrath, Daniel M. Dabbs, Ilhan Aksay & Sol M. Gruner, Lyotropic liquid crystalline L3 phase silicated nanoporous monolithic composites and their production. US Pat. 6638885 - Filed Apr 3, 2000.
- 5h. Chae Un Kim & Sol M. Gruner, Pressure cryocooling protein crystals. U.S. Patent 8030449.

**Sol M. Gruner: Publications*****i. Undergraduate Theses Supervised***

- 1i. John O'Brien (1989). A new method of mapping the temperature – water potential phase diagram of phospholipids. Senior Thesis, Physics Department, Princeton University.
- 2i. Linda M. Zeger (1989). The study of the  $L\alpha$  -  $H_{II}$  phase transition using monodomains. Senior Thesis, Physics Department, Princeton University.
- 3i. Joseph W. Stazalka (1991). Design and characterization of a capacitor-based dilatometer prototype. Independent Project, Department of Electrical Engineering, Princeton University.
- 4i. Yumi Ijiri (1991). Studies on charged phospholipid-water phase behaviors. Senior Thesis, Physics Department, Princeton University.
- 5i. Adam Daniel Polcyn (1992). A study of the negative pressure on the  $H_{II}$  phase of the DOPE/water system. Senior Thesis, Physics Department, Princeton University.
- 6i. Michael D. McGehee (1994). Self-assembling mesoscopic surfactant/silicate materials. Senior Thesis, Physics Department, Princeton University. Co-advised with I. Aksay.
- 7i. Yuqi Han (1995). Pressure and pH unfolding of staphylococcal nuclease. Senior Thesis, Physics Department, Princeton University.
- 8i. Christian Haselgrove (1997). High pressure dilatometer for phase transitions in lipids and block copolymers. Senior Thesis, Physics Department, Princeton University.
- 9i. Edward Lloyd Hutchins (1999). The creation of a nanoporous polymeric film. Senior Thesis, Dept. of Materials Science & Engineering, Cornell University. Co-advised with C.K. Ober.
- 10i. Gideon Alon (2005). SAXS from block copolymers under oscillatory shear flow. Senior Thesis, Physics Department, Cornell University.
- 11i. Thomas Caswell (2007). Study and testing of a Pixel Array Detector for scanning transmission electron microscopy. Senior Thesis, Physics Department, Cornell University. Co-advised with D. Muller.
- 12i. Elizabeth C. Landrum (2008). A study of the effects of pressure on protein crystals. Senior Thesis, Physics Department, Cornell University.
- 13i. Gabrielle Illava (2017). Technology Development to Advance Data Collection in BioSAXS and Microcrystallography. Biological Sciences Honors Program, College of Agriculture and Live Sciences.

