

Rensselaer Physics Department Activities

July 2007 - December 2007

(Rensselaer Students are underlined)

HONORS AND AWARDS

Toh-Ming Lu

- Elected as fellow of the American Association for the Advancement of Science (AAAS)

Heidi Newberg

- Gruber Cosmology Prize, 2007
- Organized and Chaired the SEGUE/Stars Working Group session of the SDSS Fall Collaboration Meeting at Fermilab, Batavia, IL, November 3, 2007

Michael Shur

- Electromagnetic Academy Fellow
- IET Fellow
- IEEE Donald Fink Best Paper Award
- IEEE Leon K. Kirchmayer Graduate Teaching Award

Christian Wetzel

- Elected to Treasurer of the Electronic Materials Conference, 2007-2010.
- Program Committee Member, 2008 IEEE International Reliability Physics Symposium.
- Program Committee Member, Second International Symposium on Growth of III-Nitrides, 2008.

Xi-Cheng Zhang

- Symposium co-chair, SPIE 6840 Terahertz Photonics, SPIE Asia Photonics, Beijing, Nov, 11, 2007.
- Chairman, NATO SET-124 / RTG-068 Task Group 2nd Business Meeting, Kaiserslautern, Germany, Dec. 5, 2007.
- Session chair, Advanced Workshop on Frontiers of Electronics, Cozumel, Mexico, Dec. 16, 2007.
- Co-chair, Workshop on Terahertz Imaging and Diagnostics, the International Symposium "Topical Problems of Biophotonics – 2007". Russia.

INVITED TALKS

Joel Giedt

- J. Giedt, "Power-counting theorem for staggered fermions," in Proceedings XXV International Symposium on Lattice Field Theory, Regensburg, Germany, July 30 - Aug. 4, 2007, Proceedings of Science (LATTICE 2007) 262.

Toh-Ming Lu

- "Interface stability of metal barriers and low K dielectrics", Short course at advanced Metallization Conference, Albany, October 8, 2007.

Heidi Newberg

- "Tails of the Milky Way," Dartmouth College Colloquium, Hanover, NH, October 24, 2007
- "The Observed Structure of the Milky Way Spheroid," Cosmic Cartography conference, Chicago, IL, Dec. 4, 2007

Michael Shur

- Michael Shur, Recent Developments in Optical and Electrical Data Transport - from THz to UV. Photonics East, Boston, MA (2007)
- N. Pala, M. Shur, R. Gaska, Plasma Wave-based THz Biodetectors, Photonics East, Boston, MA (2007)
- Saunier, P. Lee, C. Balistreri, A. Dumka, D. Jimenez, J. Tserng, H. Q. Kao, M.Y. Chao, P.C. Chu, K. Souzis, A. Eliashevich, I. Guo, S. del Alamo, J. Joh, J. Shur, M. Progress in GaN Performances and Reliability, Device Research Conference, 2007 65th Annual Publication Date: 18-20 June 2007, pp. 35-36, ISSN: 1548-3770, ISBN: 978-1-4244-1102-3
- W.B. Jackson, M. Almanza-Workman, A. Chaiken, R. Garcia, A. Jeans, H.-J. Kim, O. Kwon, H. Luo, P. Mei, C. Perlov, C. Taussig, M. S. Shur, A. Koudymov, Large Area Flexible Electronics Fabricated Using Self-Aligned Imprint Lithography, ECS Proceedings, vol. 8, No. 1, pp. 199-204 (2007)
- M. S. Shur, D. Veksler, V. Chivukula, A. Koudymov, T. Ytterdal, B. Iñiguez, and W. Jackson, Modeling Of Thin Film Transistors With Non-Ideal Contacts, ECS Proceedings, vol. 8, No. 1, pp. 165-170 (2007)

Gwo-Ching Wang

- A new technique to monitor surface technique of nanostructures, **G.-C. Wang**, F. Tang and T.-M. Lu, International Symposium on Smart Materials and Devices, Dec. 10, 11, 2007, Hong Kong.

Christian Wetzel

- "... seminar on preparing proposals for NSF and other govt. agencies," C. Wetzel, RPI Grant Writing Seminar, Troy, NY, December 10, 2007.
- "Green Laser Diode Structures in Non-Polar Homoepitaxial MOVPE," C. Wetzel, DARPA/MTO Visible InGaN Injection Lasers Kickoff Meeting, Arlington, VA, November 5-6, 2007.
- "Green and Deep Green LEDs in Polarization Controlled GaN," C. Wetzel, 10th International Conference on Advanced Materials, Bangalore, India, October 8 - 13, 2007.
- "LED Development on Polar and Non-Polar GaN Substrates," C. Wetzel, 5th International Workshop on Bulk Nitride Semiconductors, Salvador, Bahia, Brazil, September 24-28, 2007.
- "Green and Deep Green LEDs in Polarization Controlled GaN," C. Wetzel, 2007 China International Forum on Solid-State Lighting, Shanghai, China, August 22-24, 2007.
- "Polarization Screening as a Concept for a Memory Cell," C. Wetzel, European Multifunctional Materials Workshop, Averøy, Norway, June 17-21, 2007.
- "High Performance Green LEDs by Homoepitaxial MOVPE", C. Wetzel, Solid State Lighting Peer Review, Washington, DC June 5, 2007.
- "Development of high efficiency green and deep green light emitters in piezoelectric group-III nitrides," C. Wetzel, The Conference on Photonic

Applications, Systems and Technologies, PhAST 2007, Baltimore, Maryland, USA, May 7-10, 2007.

- “Piezoelectric Quantum Structure for Full Spectrum Light Emitters,” C. Wetzel, The International Conference on Metallurgical Coatings and thin Films, ICMCTF 2007, San Diego, California, USA, April 23-27, 2007.

Xi-Cheng Zhang

- X.-C. Zhang, “Terahertz sensing & imaging technology,” the 4th International Symposium on Nanovision Science & The 9th Takayanagi Kenjiro Memorial Symposium, Hamamatsu, Japan, Oct. 30, 2007.
- X.-C. Zhang, “THz technology,” Denso, Nagoya, Japan, Oct. 30, 2007.
- Xu Xie, Nicolas Karpowicz, Xiaofei Lu, Xiaoyu Guo, Jianming Dai, Yunqing Chen, Masashi Yamaguchi, and X.-C. Zhang, “Terahertz wave photonics in gas and its spectroscopic application,” plenary presentation, SPIE Asia Photonics, Beijing, Nov, 11, 2007.
- X.-C. Zhang, “Next Rays? T-Ray!,” seminar, College of Science, Kuwait University, Kuwait, Nov. 27, 2007.
- X-C. Zhang, “THz ABCD,” seminar, Physics Department, Kuwait University, Kuwait, Nov. 28, 2007.
- X-C. Zhang, “Terahertz Wave Technology for Standoff Detection of Explosives and other Military & Security Applications,” NATO SET-124, Kaiserslautern, Germany, Dec. 5, 2007.
- N. Karpowicz, J.M. Dai, L.L. Zhang, C.L. Zhang, X.-C. Zhang, “Recent Development in Broadband THz Spectroscopy” Advanced Workshop on Frontiers of Electronics, Cozumel, Mexico, Dec. 16, 2007
- “THz Wave Photonics: Horizons and Hurdles,” Plenary presentation, the International Symposium “Topical Problems of Biophotonics – 2007”. On a boat along River Volga between Gorky/Nizhny Novgorod to Moscow, August 4, 2007.

MEETING ATTENDANCE

Heidi Newberg

- “Milky Way Halo,” Bonn, Germany, May 29 to June 2, 2007
- “Women Faculty Retreat,” part of RAMP-UP, Lake George, NY, Sept. 29-30, 2007
- SDSS Fall Collaboration Meeting, Fermilab, Batavia, IL, November 2-4, 2007
- “Cosmic Cartography,” Chicago, IL, Dec. 3-4, 2007

Gwo-Ching Wang

- 54th AVS International Symp., Seattle, WA, Oct. 19, 2007.
- The 8th Conference of the Asian Crystallographic Association, AsCA’07 Taipei, Taiwan, Nov. 6, 2007.
- International Symp. on Smart materials and Devices, Hong Kong, China, Dec. 10 -11, 2007, Dec. 10 -11, 2007.

Masashi Yamaguchi

- “2007 Interconnect Focus Center Annual Review “, (Oct.3-4, 2007, Atlanta, GA)
- “Dept of Homeland Security Center of Excellence Awareness & Localization of Explosives-Related Threats Site Visit”, (Oct.10, 2007, Boston, MA)

OTHER PROFESSIONAL TRAVEL

Joel Giedt

- traveled to Syracuse for a day to meet with collaborators.

Heidi Newberg

- July 5-13, Beijing, China, to visit the LAMOST project at the Chinese Academy of Sciences
- Sept. 5-9, Cambridge, England, attend Gruber Cosmology Prize ceremony
- Sept. 29, Williams College, MA, attended Keck Northeast Astronomy Consortium Undergraduate Research Symposium in support of our undergraduate student Auralee Morin

Michael Shur

- M. S. Shur Terahertz Sensing Technology, Nortrop Grumman Space Technology, September (2007)

PRESENTATIONS

Heidi Newberg

- “Revised Parameter Estimates for the Most Metal-Poor Candidates in SDSS-I and SEGUE,” Julie A. Krugler, T.C. Beers, Y. Lee, T. Sivarani, B. Marsteller, R. Wilhelm, C. Allende Prieto, A. Frebel, J. E., Norris, J. Johnson, I. Ivans, B. Yanny, C. Rockosi, H. Morrison, H. J. Newberg, and J. Knapp, B. A. A. S., Meeting 210, #74.02
- “The relationship between tidal debris and the smooth component of the Milky Way stellar spheroid,” Milky Way Halo Conference, June 1, 2007, Bonn, Germany
- “The history of the Sloan Digital Sky Survey,” Chinese Academy of Sciences, July 9, 2007, Beijing, China
- “Galactic Structure Results from SDSS/SEGUE,” Chinese Academy of Sciences, July 10, 2007, Beijing, China
- “The Milky Way Galaxy,” Girls in Science and Technology (GIST) summer camp, The Children’s Museum of Science and Technology, Rensselaer Technology Park, NY, July 24, 2007
- “Your Textbook is Wrong about the Milky Way,” A Passion for Physics class, Troy, NY, October 4, 2007
- “From SEGUE to LAMOST,” SDSS Fall Collaboration Meeting, Fermilab, Batavia, IL, November 3, 2007

Fred Schubert

- E. Fred Schubert and Jong Kyu Kim “Light-Emitting Diodes – Looking back 100 years and looking forward to the next 10 years” 2007 China International Solid State Lighting Forum and Exhibition (CHINA SSL 2007), Shanghai, China, August 22–24 (August 2007)
- E. Fred Schubert and Jong Kyu Kim “Low-refractive-index materials: A new class of optical thin-film materials for solid-state lighting” *7th International Conference on the Numerical Simulation of Optoelectronic Devices (NUSOD 2007)*, Newark DE, September 24–27 (September 2007)
- E. Fred Schubert and Jong Kyu Kim “Light-emitting diodes – Looking back 100 years and looking forward to the next 10 years” *S&T/SID’s 15th Color Imaging Conference (CIC)*, Albuquerque NM, November 5–9 (November 2007)

Gwo-Ching Wang

- What can RHEED do beyond monitoring single crystal film growth? **G.-C. Wang**, F. Tang and T.-M. Lu, 54th AVS International Symp., post discovery session, Seattle, WA, Oct. 19, 2007.
- RHEED *surface* pole figure – A new in situ technique for polycrystalline and nanostructured surface texture analysis, **G.-C. Wang**, F. Tang and T.-M. Lu, The 8th Conference of the Asian Crystallographic Association, AsCA'07 Taipei, Taiwan, Nov. 6, 2007.
- Physics at Rensselaer – People, education and research, **G.-C. Wang**, Taipei American School, Taiwan, Nov. 5, 2007.

Christian Wetzel

- "Structural Analysis in Low V-defect Blue and Green Light Emitting Diodes", **M. Zhu**, T. Detchprohm, Y. Xia, W. Zhao, Y. Li, J. Senawiratne, S. You, L. Liu, E. A. Preble, D. Hanser, and C. Wetzel, the 2007 Material Research Society Fall Meeting, Boston, MA, USA, November 26-30, 2007.
- "Photon Modulated Electroluminescence of Green Light Emitting Diodes," Y. Li, J. Senawiratne, Y. Xia, M. Zhu, W. Zhao, T. Detchprohm, and C. Wetzel, 7th Int'l Conference of Nitride Semiconductors, Las Vegas, NV, USA, Sept. 16-21, 2007.
- "Junction Temperature Simulation of Gallium-Nitride Green LEDs Using COMSOL" **A. Chatterjee**, J. Senawiratne, Y. Li, M. Zhu, Y. Xia, W. Zhao, J. L. Plawsky and C. Wetzel, 2007 COMSOL conference, Boston, USA, Oct. 4-6, 2007.
- "Characterization of Homoepitaxial and Heteroepitaxial GaInN/GaN Light Emitting Diodes by Transmission Electron Microscopy," **M. Zhu**, J. Senawiratne, W. Zhao, Y. Xia, Y. Li, T. Detchprohm, and C. Wetzel, Electronic Materials Conference, South Bend, IN, June 20, 2007.
- "Junction Temperature Analysis of GaInN/GaN Multi-Quantum Well Light Emitting Diodes by Micro-Raman Spectroscopy," **J. Senawiratne**, Y. Li; M. Zhu, Y. Xia, W. Zhao, T. Detchprohm, C. Wetzel, Electronic Materials Conference, South Bend, IN, June 20, 2007.
- "Spectroscopic Cathodoluminescence of V-Defects in GaInN/GaN Quantum Wells," Y Xia, T. Detchprohm, J. Senawiratne, Y. Li, W. Zhao, M. Zhu, C. Wetzel, D. Koleske, M. Crawford, S. Lee, K. Bogart, Electronic Materials Conference, South Bend, IN, June 20, 2007.
- "Characterization of Homoepitaxial and Heteroepitaxial GaInN/GaN Light Emitting Diodes by Transmission Electron Microscopy," **M. Zhu**, Y. Xia, W. Zhao, Y. Li, J. Senawiratne, T. Detchprohm, C. Wetzel, Electronic Materials Conference, South Bend, IN, June 20, 2007.
- "V-defect Analysis in Green and Deep Green Light Emitting Diodes Structures", **M. Zhu**, T. Detchprohm, S. You, Y. Wang, Y. Xia, W. Zhao, Y. Li, J. Senawiratne, Z. Zhang, and C. Wetzel, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.
- "Mechanisms for enhanced quantum efficiency of InGaN quantum wells grown on InGaN underlayers," M. H. Crawford, D. D. Koleske, N. A. Missert, S. R. Lee, M. A. Banas, D. M. Follstaedt, K. H. A. Bogart, G. Thaler, and K. C. Cross, Y. Xia, C. Wetzel, and E. F. Schubert, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.
- "Photon and Electron Modulated Electroluminescence of Green Light Emitting Diodes," Y. Li, W. Zhao, Y. Xia, M. Zhu, J. Senawiratne, T. Detchprohm, and C.

Wetzel, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.

- "Improved Performance of GaInN Based Deep Green Light Emitting Diodes through V-Defect Reduction," T. Detchprohm, M. Zhu, W. Zhao, Y. Xia, Y. Li, J. Senawiratne, L. Liu, D. Hanser and **C. Wetzel**, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.
- "Junction Temperature Analysis in Green Light Emitting Diode Dies on Sapphire and GaN Substrate," **J. Senawiratne**, Y. Li, M. Zhu, Y. Xia, W. Zhao, A. Chatterjee, T. Detchprohm, J. L. Plawsky, and C. Wetzel, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.
- "Very Strong Nonlinear Optical Absorption in Green GaInN/GaN Multiple Quantum Well Structures," **W. Zhao**, M. Zhu, Y. Xia, Y. Li, J. Senawiratne, S. You, T. Detchprohm, and C. Wetzel, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, USA, September 16-21, 2007.
- "Super Fluorescence in Green Emission GaInN/GaN Quantum Well Structures under Pulsed Laser Excitation," **J. Senawiratne**, S. Tomasulo, T. Detchprohm, M. Zhu, Y. Li, W. Zhao, Y. Xia, P.D. Persans, and C. Wetzel, Fall Meeting of the Materials Research Society, Boston, MA, USA, Nov 26-30, 2007.
- "Green Light Emitting Diodes under Photon and Electron Beam Modulation," **Y. Li**, J. Senawiratne, Y. Xia, M. Zhu, W. Zhao, T. Detchprohm, and C. Wetzel, Fall Meeting of the Materials Research Society, Boston, MA, USA, Nov 26-30, 2007.
- "Low-V-defect Blue and Green GaInN/GaN Light Emitting Diodes," **M. Zhu**, Y. Xia, W. Zhao, Y. Li, J. Senawiratne, S. You, T. Detchprohm, and C. Wetzel, Fall Meeting of the Materials Research Society, Boston, MA, USA, Nov 26-30, 2007.
- "Effect of Structural Properties of AlN Templates on the Optical, Electrical, and Structural Properties of n-type AlGaIn," **W. Lee**, K. Chen, Q. Dai, S. Chhajer, M.F. Schubert, F.W. Mont, J.K. Kim, C. Wetzel, and E.F. Schubert, Fall Meeting of the Materials Research Society, Boston, MA, USA, Nov 26-30, 2007.
- "Temperature dependence of the quantum efficiency in green and deep green GaInN/GaN light emitting diodes," **Y. Li**, W. Zhao, Y. Xia, M. Zhu, T. Detchprohm, E.F. Schubert, C. Wetzel, Electronic Material Conference, University Park, PA, USA, Jun 28-30, 2006.

Masashi Yamaguchi

- **Masashi Yamaguchi**, and X.C.Zhang, Prototypes and Technologies for Improvised Explosive Device Detection, BomDetec Internal Preliminary Design Review (Aug. 15, 2007, Boston, MA)
- **Masashi Yamaguchi**, and X.C.Zhang, Prototypes and Technologies for Improvised Explosive Device Detection, BomDetec Preliminary Design Review (Oct. 1, 2007, Boston, MA)

Xi-Cheng Zhang

- F2-C. Terahertz Sensing and Imaging in DHS Site Visit for Center of Excellent (COE), ALERT: Awareness and Localization of Explosives-Related Threats. Y.Q. Chen, J.M. Dai, A. Redo, M. Yamaguchi, X.-C. Zhang Northeastern University, Boston, Oct. 10, 2007.
- X-C. Zhang, "THz Wave Photonics in Gas and Its Spectroscopic Application," NATO SET-124, Kaiserslautern, Germany, Dec. 6, 2007.
- X-C. Zhang, "THz handheld spectrometer," NATO SET-124, Kaiserslautern, Germany, Dec. 6, 2007.

- “Subwavelength terahertz imaging using gated plasma-wave electronic devices A.V. Muravjov, D.B. Veksler, A. Redo-Sanches, X.-C. Zhang, T.A. Elkmatib, K.N. Salama, and M.S. Shur, On a boat along River Volga between Gorky/Nizhny Novgorod to Moscow, August 5, 2007.

PAPERS PUBLISHED

Joel Giedt

- M. Gabella, T. Gherghetta and J. Giedt, "A gravity dual and LHC study of single-sector supersymmetry breaking," *Phys. Rev. D* 76 (2007) 055001 [published 9/7/07].
- J. Giedt and E. Poppitz, "Chiral Lattice Gauge Theories and The Strong Coupling Dynamics of a Yukawa-Higgs Model with Ginsparg-Wilson Fermions," *Journal of High Energy Physics* 0710 (2007) 076 [published 10/22/07].

Toh-Ming Lu

- “Preferred Orientation in Ru Nanocolumns Induced by Residual Oxygen”, J. P. Singh, T. Karabacak, P. Morrow, S. Pimanpang, T.-M. Lu, and G.-C. Wang, *Journal of Nanoscience and Nanotechnology* 7, 2192 (2007).
- “Self-shadowing in ballistic fan formation from point seeds,” M. Pelliccione and T.-M. Lu, *Phys. Rev. B* 75, 245431 (2007).
- “Non-local effects in thin film growth”, M. Pelliccione and T.-M. Lu, *Modern Physics Letters B*, Vol. 21, No. 19, 1207 (2007).
- “In situ reflection high energy electron diffraction surface pole figure study of biaxial texture evolution in anisotropic Mg nanoblades during shadowing growth”, F. Tang, G.-C. Wang, and T.-M. Lu, *J. Appl. Phys.* 102, 14306 (2007).
- “Plasma-Enhanced Atomic Layer Deposition of Palladium on a Polymer Substrate”, G. A. Ten Eyck, S. Pimanpang, J. S. Juneja, H. Bakhru, T.-M. Lu, G.-C. Wang, *Chemical Vapor Deposition* 13, Issue 6-7, 307 (2007).
- “Effects of three-dimensional Ehrlich-Schwoebel barrier on texture selection during Cu nanorod growth”, [Christopher G. Johansen](#), [Hanchen Huang](#), and [Toh-Ming Lu](#), *Appl. Phys. Lett.* 91, 121914 (2007).
- “Surface texture evolution of polycrystalline and nanostructured films: RHEED surface pole figure analysis”, TOPICAL REVIEW, F Tang, T Parker, G-CWang and T-M Lu, *J. Phys. D: Appl. Phys.* 40 (2007).
- “Wetting and Electro-Wetting Properties of Carbon Nanotube Templated Parylene Films”, Zuankai Wang, Ya Ou, Toh-Ming Lu and Nikhil Koratkar, *J. Phys. Chem. B*, **111** (17), 4296 (2007)
- “Ballistic Aggregations on Two-dimensional Arrays of Seeds with Oblique Incident Flux”, D.-X. Ye and T.-M. Lu, *Phys. Rev. B* 76, 235402 (2007).
- “Interface Stability of Metal Barrier and low K Dielectrics”, T.-M. Lu, Y. Ou, and P.-I. Wang, in *Materials, Processes, Integration and Reliability in Advanced Interconnects for Micro- and Nanoelectronics*, Editors: Qinghuang Lin, E. Todd Ryan, Wen-li Wu, Do Yeung Yoon, *Mat. Res. Soc. Symp. Proc.* 990-B09-05 (2007).
- “Enhancement of Cu(hfac)₂ chemisorption on the Paralene surface by N₂ plasma surface modification”, S. Pimanpang, Pei-I. Wang, Dexian Ye, Jasbir S. Juneja, G.-C. Wang, and T.-M. Lu, *J. of Electrochemical Society* 154 (10), G215 –G219 (2007).

- “Shadowing Growth of Three-dimensional Nanostructures on Periodic Arrays of Seeds: The effect of the size of the seeds”, D.-X. Ye, Charles L. Ellison, and T.-M. Lu, submitted to J. Appl. Phys.
- “Size control of Cu nanorods through oxygen-mediated growth and low-temperature sintering”, Pei-I Wang, Thomas C. Parker, Tansel Karabacak, G.-C. Wang, and T.-M. Lu, Thin Solid Films, submitted.
- Effect of Nanotips on the Hydrophilicity of Metallic Nanorod Surfaces D.-X. Ye and T.-M. Lu, Phys. Rev. Lett., submitted.
- “Novel photocurable epoxy siloxane polymers for photolithography and imprint lithography applications”, Pei-I Wang, O. Nalamasu, Rajat Ghoshal, Ram Ghoshal, Charles D. Schaper, Andrew Li, Toh –Ming Lu, JVST B, submitted.
- “Biaxially oriented CaF₂ films on amorphous substrates”, H.-F. Li, T. Parker, F. Tang, G.-C. Wang, T.-M. Lu, S. Lee, Appl. Phys. Lett., Submitted.

Heidi Newberg

- “Less Pay, A Little Less Work,” Heidi Jo Newberg, *Motherhood: The Elephant in the Laboratory*, edited by Emily Monosson, Cornell University Press, in press
- “Maximum Likelihood Fitting of Tidal Streams with Application to the Sagittarius Dwarf
- Tidal Tails, Cole, N., Newberg, H. J., Magdon-Ismail, M., Desell, T., Dawsey, K., Hayashi, W., Liu, X., Purnell, J., Szymanski, B., Varela, C. & Wisniewski, J., *Ap. J.*, submitted
- “Candidate Milky Way satellites in the Galactic halo,” Liu, C., Hu, J., Newberg, H., and Zhao, Y., *A&A*, submitted
- “The SEGUE Stellar Parameter Pipeline. II. Validation with Galactic Globular and Open Clusters,” Lee, Y. S., Beers, T. C., Sivarani, T., Johnson, J. A., An, D., Wilhelm, R., Allende Prieto, C., Koesterke, L., Re Fiorentin, P., Bailer-Jones, C. A. L., Norris, J. E., Yanny, B., Rockosi, C. M., Newberg, H. J., Cudworth, K. M., Pan, K., A.J., submitted
- “The SEGUE Stellar Parameter Pipeline. I. Description and Initial Validation Tests,” Lee, Y. S., Beers, T. S., Sivarani, T., Allende Prieto, C., Koesterke, L., Wilhelm, R., Norris, J. E., Bailer-Jones, C. A. L., Re Fiorentin, P., Rockosi, C. M., Yanny, B., Newberg, H., Covey, K. R., *A.J.*, submitted
- “The Fifth Data Release of the Sloan Digital Sky Survey,” Adelman-McCarthy et al., *Ap.J.Suppl.*, **172**, 634, 2007
- “The Overdensity in Virgo, Sagittarius Debris, and the Asymmetric Spheroid,” Newberg, H. J., Yanny, B., Cole, N., Beers, T. C., D., Re Fiorentin, P., Schneider, D. P., and Wilhelm, R., *Ap. J.*, **668**, 221-235, 2007
- “Overdensity in Virgo, Sagittarius debris and the asymmetric spheroid,” Newberg, H., Proceedings of The Milky Way Halo – Stars and Gas – Locations, Motions, Origins (2007), <http://www.astro.uni-bonn.de/~mwhalo/proceedings/>

Fred Schubert

- Schubert, Martin F., Sameer Chhajed, Jong Kyu Kim, E. Fred Schubert, and Jaehee Cho “Polarization of light emission by 460 nm GaInN/GaN light-emitting diodes grown on (0001) oriented sapphire substrates” *Applied Physics Letters* **91**, 051117 (August 2007)
- Schubert, Martin F., Ahmed Noemaun, Sameer Chhajed, Jong Kyu Kim, E. Fred Schubert, and Cheolsoo Sone “Encapsulation shape with non-rotational symmetry designed for extraction of polarized light from unpolarized sources” *Optics Express* **15**, 10452 (August 2007)

- **(Invited)** Schubert, E. Fred and Jong Kyu Kim “Low-refractive index materials: A new class of optical thin-film materials” *Physica Status Solidi B* **244**, 3002 (DOI: 10.1002/pssb.200675603) (August 2007)
- Chen Kaixuan X., Q. Dai, W. Lee, J. K. Kim, E. F. Schubert, W. Liu, S. Wu, X. Li, and J. A. Smart “Parasitic sub-band-gap emission originating from compensating native defects in Si doped AlGaInN” *Applied Physics Letters* **91**, 121110 (September 2007)
- Schubert, Martin F., Sameer Chhajed, Jong Kyu Kim, E. Fred Schubert, and Jaehee Cho “Linearly polarized emission from GaInN light-emitting diodes with polarization-enhancing reflector” *Optics Express* **15**, 11213 (September 2007)
- **(Invited)** Schubert, E. F., J. K. Kim, and J.-Q. Xi “Light-emitting diodes hit the centenary milestone” *Compound Semiconductors* October issue, page 20–23 (October 2007)
- Kim, Min-Ho, Martin F. Schubert, Qi Dai, Jong Kyu Kim, E. Fred Schubert, Joachim Piprek, and Yongjo Park “Origin of efficiency droop in GaN-based light-emitting diodes” *Applied Physics Letters* **91**, 183507 (October 2007)

Michael Shur

- Pala, N. Yang, Z. Koudymov, A. Hu, X. Deng, J. Gaska, R. Simin, G. Shur, M. S., Drain-to-Gate Field Engineering for Improved Frequency Response of GaN-based HEMTs, Device Research Conference, 2007 65th Annual, 18-20 June 2007, pp. 43-44, ISSN: 1548-3770, ISBN: 978-1-4244-1102-3
- Michael Shur. Terahertz Sensing Technology, in Tutorial Book, IEEE Sensors Conference, October 26-31 (2007) pp. 252-310
- W.J. Stillman and M.S. Shur, Closing the Gap: Plasma Wave Electronic Terahertz Detectors, *Journal of Nanoelectronics and Optoelectronics*, Vol. 2, 1–13, 2007
- S. L. Romyantsev, Kristel Fobelets, Thomas Hackbarth, and Michael S. Shur, Low Frequency Noise in Insulated-Gate Strained-Si n-Channel Modulation Doped Field Effect Transistors, *Japanese Journal of Applied Physics* Vol. 46, No. 7A, pp. 4011–4015 (2007)
- V. Tokranov, S.L. Romyantsev, M. S. Shur, R. Gaska, S. Oktyabrsky, R. Jain, N. Pala, The HfO₂/AlGaIn/GaN structures with HfO₂ deposited at ultra low pressure using e-beam, *phys. stat. sol. (RRL)* 1, No. 5, 199–201 (2007) / DOI 10.1002/pssr.200701136
- Dmitry Veksler, Andrey Muravjov, William Stillman, Nezih Pala, and Michael Shur, Detection and Homodyne Mixing of Terahertz Gas Laser Radiation by Submicron GaAs/AlGaAs FETs, in Abstracts of IEEE sensors Conference, Atlanta, GA, October 2007, p. 229-230
- W. Stillman, F. Guarin, V. Yu. Kachorovskii, N. Pala, S. Romyantsev, M.S. Shur, and D. Veksler, Nanometer Scale Complementary Silicon MOSFETs as Detectors of Terahertz and Sub-terahertz Radiation, in Abstracts of IEEE sensors Conference, Atlanta, GA, October 2007, pp. 479-480
- N. Pala, D. Veksler, A. Muravjov, W. Stillman, R. Gaska, and M. S. Shur, Resonant Detection and Modulation of Terahertz Radiation by 2DEG Plasmons in GaN Grating-Gate Structures, in Abstracts of IEEE Sensors Conference, Atlanta, GA, October 2007, pp. 291-292
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¹ Department of Physics, Applied Physics and Astronomy, Rensselaer Polytechnic Institute, Troy, New York 12180-3590
² Department of Applied Physics, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, PR China
³ Department of Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy, New York 12180-3590 J. Nanotechnology 18, 295702 (2007).
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Masashi Yamaguchi

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- Real-time transition of a photonic crystal to a surface plasmon resonance,” J. G. Han, Azad, W. L. Zhang, J. Z. Xu, J. Chen, and X.-C. Zhang, WuLi (Chinese Physics Today), **36**, 507, 2007.
- “Absorption coefficients of selected explosives and related compounds in the range of 0.1-2.8 THz,” Jian Chen, Yunqing Chen, Hongwei Zhao, Glenn J. Bastiaans, and X.-C. Zhang, Optical Express, **19**, 12060, 2007.
- “THz science, technology, and applications,” Jingzhou Xu and X.-C. Zhang, Peking University Press, ISBN978-7-301-12503-8, 2007.
- “Scanning the issue, T-ray imaging, sensing, and retection” D. Abbott and X.-C. Zhang, Proceedings of the IEEE **95**, 1509, 2007
- “THz spectroscopy and imaging for defense and security applications”, Hai-Bo Liu, Member, IEEE, Hua Zhong, Nicholas Karpowicz, Yunqing Chen, and X.-C. Zhang, Proceedings of the IEEE **95**, 1514, 2007

PROPOSALS (SUBMITTED or GRANTED)

Joel Giedt

- Submitted Outstanding Junior Investigator, Office of High Energy Physics, Department of Energy proposal: "Strongly coupled supersymmetry from the lattice, warped extra dimensions and warped strings: spectrum calculations, LHC phenomenology and implications for neutrino experiments." Sole PI, amount \$203,710.

Toh-Ming Lu

Granted:

- “Reliability of Cu/ultra-low-k material systems”, SRC, \$118,000, funded, Feb 1, 2008-Jan 31, 2009.
- “MRI: Acquisition of surface enhanced confocal Raman-AFM”, PI: Chang Ryu, Co-PI: Toh-Ming Lu, Robert Linhardt, Dick Siegel, NSF, \$445,000, Sept 1, 2007 to August 31, 2008, funded.
- “PIRE: POLYMER Education and Research Partnership between US and Korea”, Toh-Ming Lu as Senior Personnel, PI: Chang Ryu, \$500K/year for five years, NSF, funded.

Submitted:

- “A novel reflection high-energy electron diffraction surface pole figure technique for in situ study of growth front biaxial texture evolution”, PI: Gwo-Ching Wang, Co-PI: Toh-Ming Lu, DOE, \$688,000, May 15, 2008-May 14, 2011, pending.
- “Testing of material fatigue and rate effects at the nanoscale using isolated nanostructures”, PI: C. Picu, Co-PI: G.-C. Wang and T.-M. Lu, NSF, \$475,000, June 1, 2008-May 31, 2011, pending.
- “Fundamental study of Pt nanorod catalyst-electrode structures for high efficiency

fuel cells”, PI: N. Koratkar, Co-PIs: Toh-Ming Lu, and Glenn Eisman, DOE, \$640,000, August 1, 2008 – July 31, 2011, pending.

- “Fundamental study of Pt nanorod catalyst-electrode structures for high efficiency fuel cells”, PI: N. Koratkar, Co-PIs: Toh-Ming Lu, Tansel Karabacak, and Glenn Eisman, NSF, \$225,000, August 1, 2008 – July 31, 2011, pending.
- “Hydrogenation/de-hydrogenation in Pd-coated ultra-thin Mg nanoblades”, PI: Gwo-Ching Wang, Co-PIs: Toh-Ming Lu and Shengbai Zhang, NSF, \$430,000, May 15, 2008 – May 14, 2011, pending.
- “Realization of Photonic Band Gap Materials and Photonic Heterostructures By Innovative Material Growth”, PI: S. Lin and Co-PI: T.-M. Lu, NSF, \$370,000, Feb 1, 2008- Jan 31, 2011, pending.

Heidi Newberg

- “REU Supplement: Revealing the Structure of the Galactic Halo through Statistical Analysis – Middle School Teacher Training,” March 2007, \$13,444, NSF, granted
- “REU Supplement: SEI(AST): A Dynamic Grid for Astroinformatics: Data-Driven Discovery of the Milky Way Origin and Evolution from the Sloan Digital Sky Survey,” March 2007, Magdon-Ismael, Szymanski, Varela, and Newberg, March 2007, \$50,000, NSF, granted
- “National Space Grant College and Fellowship Program,” New York Space Grant consortium, Cornell University, starting April 1, 2008, \$10,000
- “Planning US Partnership in Galactic Structure with the Chinese LAMOST Telescope,” June 1, 2008, 15 months, \$150,737

Michael Shur

Granted:

- Workshop on “Frontiers in Electronics”, 2007 US Dept. of Defense, L10536 \$5,000 7/1/07 – 12/31/07
- Nitride-based Terahertz Nanoelectronics, U.S. Civilian Research and Development Foundation, J90255 \$11,900 2/1/06 – 1/31/08
- Exitaxial Multifunctional Materials & Applications: Revolutionary Epitaxial Universities, J90222 \$318,255 5/1/04 – 11/30/07
- Connection One Consortium for Telecommunication Circuits and Systems Velox Semiconductor Corporation, J71098 \$50,000 4/24/06 – 4/23/08
- Connection One Consortium for Telecommunication Circuits and Systems IBM, J71097 \$100,000 5/26/06 – 5/26/08
- Modeling and Characterization of ZnO and a-Si Thin Film Transistors Hewlett Packard Co., J71068 \$158,140 11/01/05 – 12/31/09
- Workshop on “Frontiers in Electronics” 2007 US Dept. of Defense, J11895 \$10,000 9/1/07 – 2/29/08
- Workshop on “Frontiers in Electronics” 2007 National Science Foundation, J11879 \$10,000 9/1/07 – 8/31/08
- Workshop on “Frontiers in Electronics” 2007 US Dept. of Defense, J11851 \$10,000 9/1/07 – 8/31/08
- MRI: Development of Backward Wave Oscillator Tunable Broadband THz Source for THz Electronics Research, THz-Materials Research and THz-Imaging National Science Foundation, J11761 \$390,000 9/1/06 – 8/31/08
- THz Detection of Improvised Explosive Devices US Dept. of Defense, J11745 \$487,911 6/1/07 – 6/9/09

- RPI Research Site of Industry/University Cooperative Research Center “Connection One” National Science Foundation, J11536 \$210,000 11/1/04 – 10/31/08
- IGERT: Terahertz Science and Technology-A Studio-Based Approach; National Science Foundation, J11435 \$3,904,902 1/1/03 – 9/30/08

Submitted:

- Multi-Input Antenna Transceiver (MIMOTRX); National Science Foundation, 54205517A \$35,000 9/1/05 – 8/31/08
- Intracavity THz Laser Spectroscopy for Human Breath Analysis; National Science Foundation, 2453 \$321,132 1/1/08 – 12/31/10
- Nonlinear and Double Resonance THz Spectroscopy for Molecular Recognition US Dept. of Defense, 2398 \$1,521,981 11/15/07 – 11/14/10
- Workshop on “Frontiers in Electronics”, 2007 Air Force Research Lab, 2333 \$5,000 9/1/07 – 8/31/08
- Modeling of Nanoscale Spintronic Devices SUNY – Albany, 2332 \$83,200 8/1/07 – 7/31/08
- CMOL Technology Development Sensor Electronic Technology Inc., 2319 \$20,000 8/1/07 – 8/31/08
- High Efficiency Deep Green Light Emitting Diodes Sensor Electronic Technology Inc., 2292 \$30,000 8/1/07 – 1/31/08
- Granular Pyroelectric Semiconductor Devices for Multifunctional Applications US Dept. of Defense, 2158, 21405517A \$204,766 7/1/07 – 6/30/10
- Materials and Device Development for High Performance MW-Wave AlInGaN HFET’s and MOSHFET’s ;Universities \$816,034 5/1/05 – 4/30/10
- Amorphous and Poly-Si TFT Modeling for LCD Applications Samsung Electro-mechanics Co. Ltd., 2090 \$149,995 4/1/07 – 3/31/08
- Micro Autonomous System and Technology Center for Microelectronics Universities, 1788 \$2,500,000 5/1/07 – 4/30/12
- Granular Pyroelectric Semiconductor Devices for Multifunctional Applications US Dept. of Defense, 1721 \$235,960 10/1/06 – 9/30/09

Gwo-Ching Wang

Granted:

- Proposal on Department Change Initiative, G.-C. Wang, G. Adams, J. Schroeder, \$10K for 1 year. Submitted to RAMP-Up Advisory Board, Oct. 4, 2007, granted.
- Hands-on physics outside classroom, G.-C. Wang, D. Millard, G. Bedrosian, and S. Dwyer, NSF, \$150K, two years, 2007-2008, granted.

Submitted:

- REU in physics at Rensselaer, G.-C. Wang, The NSF, \$222K for 2008-2010, submitted on Sept. 12, 2007.
- Hydrogenation/dehydrogenation in Pd-coated ultrathin Mg nanoblades: Experimental study and first-principles calculations, G.-C. Wang, T.-M. Lu and S.B. Zhang, NSF, \$430K for 2008-2010, Sept. 14, 2007.
- Testing material fatigue and rate effects at the nanoscale using isolated nanostructures, R.C. Picu, G.-C. Wang and T.-M. Lu, NSF, \$475.2K 2008-2010, submitted Sept. 30, 2007.
- A Novel Reflection High-Energy Electron Diffraction *Surface Pole Figure* Technique for *in situ* Study of Growth-Front Biaxial-Texture Evolution, G.-C. Wang and T.-M. Lu, DOE, \$688K, 2008-2011, submitted Oct. 2007.

- RF graphene electronics, E. Bhat, G.-C. Wang and S. Nayak, 2008-2009, DARPA, \$928K. Submitted Oct. 2007.
- Nanorod arrays for the generation of intense THz wave, Yamaguchi, Nayak, and Wang, 2008-2011, The NSF, \$470K, Submitted Nov. 2nd, 2007.
- Application of x-ray diffraction for the determination of multi-axis lattice deformation in crystalline explosives using synchrotron radiation, Wang, Gamache (Naval Surface Warfare Center Indian Head), ONR, \$225K, 2008-2011, submitted Nov. 17, 2007.

Christian Wetzel

- Research In Light-Emitting Diodes (LEDs), 7/2007 – 6/2008, \$370,299, Samsung Electro-Mechanics Company, Ltd., Suwon, South Korea, granted.
- Collaborative Research on Nanoscience related to Solid State Lighting, 10/2007 – 9/2009, \$170,000, Sandia National Laboratory, granted.
- MRI: Acquisition of a Multipurpose X-ray Diffractometer System for Advanced Materials Research and Education, 7/2008 – 6/2009. \$389,982, National Science Foundation.
- VIGIL - Green Laser Diode Structures in Non-Polar Homoepitaxial MOVPE, 1/2008 – 12/2011, \$3,728,886, Defense Advanced Research Project Agency, granted.
- Epitaxy Development of Light Emitting Diodes, 8/2007 – 7/2008, \$ 60,000, Applied Materials, granted.
- Smart Lighting Engineering Research Center, 7/2008 – 6/2013, ca \$10M, National Science Foundation, invited.
- Building Bridges from High School to Grad School: Inspiring Students Through Discovery-based Activities in Energy and the Environment, National Science Foundation

Masashi Yamaguchi

Submitted

- “Advanced Location of Explosive Related Threats (ALERT)”, PI X.-C.Zhang, co-PIs B.Roysam, M.Yamaguchi, R.Radke, B.Yazici, July 2007, Department of Homeland Security (Subcontract to Northeastern University) \$2,400,000 for three years, Submitted, July 2007.
- “MURI: Study of Multimode Thermal Transport across Controllably Designed Nanoscale Junctions of Dissimilar Materials “, Theodorian Borca-Tasciuc(RPI), co-PIs P.M. Ajayan (Rice), B.Yakobson (Rice), J.Kono (Rice), D.Borca-Tasciuc (RPI), M.Yamaguchi (RPI), J.Plawsky (RPI), M.Upamanyu (Colorado School of Mines), Air force, August 2007, White paper submitted, not funded.
- “Nanorod Arrays for the Generation of Intense Terahertz Wave”, PI M.Yamaguchi, S.Nayak, and G.C.Wang, NSF, November 2007, \$470,079 submitted.

Xi-Cheng Zhang

Granted:

- Army Night Vision Lab, “Sensors for explosive detection (SED)”, X.-C. Zhang, \$1.05M, (Phase I, 18 months, \$249,995, Phase II, two years, \$800,000), September, 2007. Granted.
- Idaho National Lab, THz Technology, \$90,000. one year, 2008. Granted.
- South Africa CSIR, “Ten days Rental Inspection of High Voltage Isolator with THz Waves,” \$25,000, 10 days, 2007. Granted.
- Boeing Phantom Work, “THz wave measurement,” A. Redo and X.-C. Zhang,

- \$7,500, one week, 2007. Granted.
- University of Waterloo, (Canada), “THz wave measurement,” A. Redo and X.-C. Zhang, \$3,120, one day, 2007. Granted.
- NSF SBIR “Compact THz-ABCD Spectrometer”, NSF-IIP 0740625, \$100,000 with Zomege THz Corp (Rensselaer’s share \$30,000), six months, starting on Jan. 2008. Granted.
- NSF REU on THz Photonics, \$6,000, 2008. Granted.

Submitted:

- JIEDDO “Field test of THz ABCD,” \$100,000 with Zomege THz Corp (Rensselaer’s share \$60,000), one week Jan. 2008. pending.
- NYSTAR Technology Transfer Incentive Program, “Miniature high performance THz spectrometer,” X.-C. Zhang and A. Redo, \$500,000, two years, 2007. Submitted.
- DHS-CenSSIS ALERT program, PI, X.-C. Zhang, co-PI, J.M. Dai, A. Redo, Y.Q. Chen, M. Yamaguchi, \$1.6M, four years, 2007. Submitted.
- DOE SBIR Phase I, InnoSense LLC, “A portable polarization discriminating THz remote sensor”, (RPI share is \$33000 for 6 months) 2007. Submitted.
- Optoelectronics Industry Development Association [OIDA], “Chirped mirrors of a pre-chirp generator for remote terahertz wave generation in laser induced air plasma,” \$10,000. PI: Prof. Zhang, co-PI: Prof. Dai. Award.
- Optoelectronics Industry Development Association [OIDA], “High speed, high voltage modulator for THz generation,” \$10,000. : Prof. Zhang, co-PI: Dr. Y.G. Zhao. Award.
- Gerber Scientific International “Development of a Leather inspection device based on a fast-reflective Terahertz imaging system” \$85,000 (10 months): Prof. Zhang, and Prof. A. Redo. Award.

SIGNIFICANT RESULTS OBTAINED OR NEW RESEARCH AFFILIATES

Toh-Ming Lu

Patent Granted:

- “Siloxane epoxy polymers as metal diffusion barriers to reduce electromigration”, P.-I. Wang, T.-M. Lu, R. Ghoshal, and R. Ghoshal, US Patent No. 7285842 (2007).

Michael Shur

Patent Granted:

- M. Shur and R. Gaska, Electromagnetic Radiation Generation Based on an Object Characteristic, US Patent 7,235,766, June 26 (2007)
- Q. Fareed, R. Gaska and M. S. Shur, Methods of Growing Nitride-Based Film Using Varying Pulses, provisional patent filed on May 7, 2003, published: No 20040224484 US Patent 7192849, March 20 (2007)

VISITORS TO RENSSELAER

Heidi Newberg

- Haotong Zhang, Chinese Academy of Sciences, LAMOST, April 8- May 9. Started a collaboration on SEGUE velocity data, exchanged information about SDSS and possible LAMOST surveys.

- Brian Yanny, Fermilab, May 13-18, 2007, continue collaboration on detection of substructure in the Galactic spheroid.
- Brian Yanny, Fermilab, July 24-30, 2007, continue collaboration on detection of substructure in the Galactic spheroid.
- Peter Mack, Sept. 28-29, fixed problems with telescope dome
- Licai Deng, Chinese Academy of Science, LAMOST, November 8-9, 2007, work collaborative NSF proposal
- Alex Szalay, Johns Hopkins University, physics colloquium speaker
- Brian Yanny, Fermilab, Dec. 17-20, 2007, continue collaboration on detection of substructure in the Galactic spheroid.

IMPORTANT ACTIVITIES OF STUDENTS

Joel Giedt

- Grad. students: Daniel Carrero studied classical field theory in AdS(5) background. David Hunt studied top production using event simulation code that is publically available. Undergrad. students: Matthew Pevarnik and Saroosh Shabbir studied neutrino phenomenology from a warped extra dimension using Maple and Mathematica scripts they wrote.

Heidi Newberg

- Melissa Anderson successfully defended her PhD thesis: "Double Dalitz Plot Analysis of Flavor and CP Modes," August 24, 2007.
- Nate Cole presented "Maximum Likelihood Fits to the Sagittarius Stream," SDSS Spring Collaboration Meeting, Drexel University, Philadelphia, PA, April 2, 2007
- Nate Cole presented "Scientific Discovery Through Computationally Intensive Maximum Likelihood Evaluation" at CDI Symposium, Troy, NY, Sept. 7, 2007.
- Nate Cole passed candidacy exam, April 24, 2007
- Nate Cole presented "Maximum Likelihood Fits to the Sagittarius Dwarf Tidal Tails," SDSS Fall Collaboration Meeting, Fermi National Accelerator Laboratory, November 3, 2007
- Ben Willett presented "N-Body Simulations of Dwarfs," SDSS Spring Collaboration Meeting, Drexel University, Philadelphia, PA, April 1, 2007
- Ben Willett attended the International Max Planck Research School 2nd Heidelberg Summer School: The Milky Way Galaxy, Heidelberg, Germany, August 29, 2007 – September 5, 2007

Michael Shur

- Doctoral Thesis - D. Veksler,

OTHER

Michael Shur

Books Edited

- M. S Shur, Paul Maki, and James Kolodzey, Editors, Advanced Semiconductor Devices, Proceedings of the 2006 Lester Eastman Conference, Cornell, Ithaca, NY, USA 26 August 2006, Selected Topics in Electronics and Systems - Vol. 45, World Scientific, ISBN 978-981-270-858-8 (2007)
- Mehdi Anwar, Anthony J. DeMaria, Michael S. Shur, Editors, Proceedings of SPIE -- Volume 6772: Terahertz Physics, Devices, and Systems II (2007)

- Yue Kuo, Dieter G. Ast, Michael Shur, Preface, Proceedings of 2007 International Conference on semiconductor Technology for Ultra Large Scale Integrated Circuits and Thin Film Transistors (ULSIC vs. TFT), ECS Transactions, Volume 8, No. 1 (2007), ISSN 1938-6737 (online), ISSN 1938-5862 (print)
- M. S. Shur, S. L. Rumyantsev and M. E. Levinshtein, Editors, SiC Materials and Devices – vol. 2, World Sci. (2007) ISBN 981-270-383-5

Xi-Cheng Zhang

Published Books

- J. Z. Xu and X.-C. Zhang, “THz Science and Technology,” Physics Series Book, ISBN 978-7-301-12503-8, Peking University Press. China. 2007.
- Terahertz frequency detection and identification of materials and objects, edited by R.E. Miles, X.-C. Zhang, H. Eisele, A. Krotkus, NATO Science for Peace and Security Series – B: Physics and Biophysics, ISBN 978-1-4020-6501-9, Springer, The Netherlands. 2007.