

# MICHAEL GEIST LITTMAN

## ***PERSONAL:***

Office: D-202A Engineering Quadrangle, Princeton University  
Department of Mechanical & Aerospace Engineering  
Princeton, NJ 08544, USA  
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## ***EDUCATION:***

1977: Ph.D. Physics, Massachusetts Institute of Technology  
Thesis: "Stark Structure of Atomic Sodium"  
Advisor: Professor Daniel Kleppner  
1972: B.A. *summa cum laude*, Brandeis University

## ***EMPLOYMENT:***

2000 - Professor, Department of Mechanical and Aerospace Engineering,  
Princeton University, Princeton, NJ  
2004-07 Associate Chairman, Department of Mechanical and Aerospace  
Engineering, Princeton University, Princeton, NJ  
1998 - Departmental Representative, Department of Mechanical and Aerospace  
Engineering, Princeton University, Princeton, NJ  
1985-00 Associate Professor, Department of Mechanical and Aerospace  
Engineering, Princeton University, Princeton, NJ  
1979-85 Assistant Professor, Department of Mechanical and Aerospace  
Engineering, Princeton University, Princeton, NJ

## ***SOCIETIES:***

Fellow, Optical Society of America  
Member, Sigma Xi  
Member, Phi Beta Kappa

## ***RESEARCH INTERESTS AND HISTORY:***

### **Terrestrial Planet Finder and Satellite Navigation**

- ◆ Implementation and Optimization of Spenser Pupil for Coronagraphs (binary telescope masks to limit diffractive obscuration of faint planet near bright star)
- ◆ Design of celestial navigation system using local objects to determine satellite position (joint with Princeton Satellite Systems, Princeton, NJ)

### **Excited Atoms in External Fields**

- ◆ Weak-to-strong electric field spectroscopy of hydrogen-like (Rydberg) atoms using tunable dye laser, atomic beam, and electric field ionization methods
- ◆ Electric field ionization of excited atoms via electron tunneling and state mixing
- ◆ First observation (with Ducas and Zimmerman) of quantum beat phenomenon in optical absorption
- ◆ Study of crossed electric and magnetic field effects on highly excited atoms

### **Tunable Lasers**

- ◆ Co-inventor (with Metcalf) of grazing-incidence method for reducing the bandwidth of tunable lasers
- ◆ Co-inventor (with Liu) of the synchronous-scanning method for broad band tuning of single-mode tunable lasers

### **Combustion Diagnostics**

- ◆ First observation (with Gomez and Glassman) of laser-induced incandescence of soot in diffusion flames

### **Parallel Computers**

- ◆ Co-inventor (with Nosenchuck) of the Navier-Stokes Computer - a NASA-sponsored parallel/pipelined computer applicable to the solution of partial differential equations

### **Quantum and Wave Control**

- ◆ Controlled optical birefringence in molecular vapors using laser pump-probe methods
- ◆ Laser-produced acoustic waves for non-destructive evaluation of defects in the interior of solids
- ◆ Fundamental operating principles of nanoscale electronic devices - quantum electrons in semiconductor devices
- ◆ Iterative learning control and quantum computing

### **Biomimic Robots**

- ◆ Applications of biological principles to the control and design of robotic systems

### **CONSULTING HISTORY:**

- \* EG&G/Princeton Applied Research Corporation, Princeton, NJ  
Light Signatures, Inc., Los Angeles, CA  
Molelectron Corporation, Sunnyvale, CA
- \* Mnemos, Inc., Lawrenceville, NJ  
Electrographics, Inc., Southampton, PA  
Quanta-Ray, Inc., Mountain View, CA
- \* Lumonics, Inc., Kanata, Ontario, Canada  
Partnership Limited, Lawrenceville, NJ
- \* Concurrent Computer, Tinton Falls, NJ
- \* Thermapeutics Corp., Trenton, NJ  
Newport Research Corp., Fountain Valley, CA  
Teltech, Chicago, IL
- \* Universal Instruments, Binghamton, NY  
ADC Telecommunications, Ewing, NJ  
Weil, Gotshal & Manges, Menlo Park, CA
- \* Princeton Satellite Systems, Inc., Princeton, NJ
- \* Goodwin Procter LLP, New York, NY  
Andlinger & Company, Inc., Tarrytown, NY

\* = major consulting projects

### **TEACHING HISTORY:**

- MAE 511 Experimental Methods Laboratory
- MAE 548 Applications of Quantum Mechanics to Modern Optics and Spectroscopy
- \* MAE 412 Microprocessors for Measurement and Control
- CHE 404 Molecular Spectroscopy (jointly with D. McClure and W. Warren)
- \* CIV 102 Engineering in the Modern World (with D. Billington)
- \* MAE 433 Feedback Control Systems
- \* EGR 194 Integrated Introduction to Engineering, Math, Physics
- \* EGR 250 Engineering Projects in Community Service (EPICS)
- \* FRS 108 Freshman Seminar entitled, "The Art and Science of Motorcycle Design"

\* = *current*

### **HONORS:**

- 2010 OSA Fellow
- 2005 OSA Optical Engineering Excellence Award
- 1989 Honorary Member, The Franklin Institute Science Museum
- 1981 Alfred Rheinsein Award, School of Engineering and Applied Science
- 1972 Louis Brandeis Honorary Scholar

### **PROFESSIONAL AND OTHER ACTIVITIES:**

- Member OSA Leadership Award Committee, 2010
- Chairman Esther H. Beller Award Committee of the OSA, 1995-96
- Chairman 1990 Annual Meeting of the OSA, Boston, MA
- Topical Editor JOSA part B Atomic Spectroscopy (1983-1986)
- Member NAS/NRC Committee on Atomic Spectroscopy (1978-1981)
- Member Princeton Regional Schools Board of Education (1993 – 1999)

### **MUSEUM EXHIBITS:**

- 1989-95: Railroad Hall "Computerized Model Railroad" – exhibit co-designer, Franklin Institute Science Museum, Philadelphia PA
- 1992-97: "Its All in Your Head", SMEC (Science Museum Exhibit Consortium) Traveling Exhibit about the Brain – designer of three devices and exhibit advisor, Franklin Institute Science Museum, Philadelphia, PA

### **PATENTS:**

1. No. 4,811,214: "MultiNode Reconfigurable Pipeline Computer," D.M. Nosenchuck and M.G. Littman (March 7, 1989)
2. No. 4,860,748: "Thermal Pattern Generator for Pain Control," A. Chiurco and M.G. Littman (August 29, 1989)

### **PUBLICATIONS:**

1. M.J. Levine, D. Schwalm, and M.G. Littman, "<sup>12</sup>C Decay of Highly Excited States in <sup>24</sup>Mg," *J. de Phys.* **32**, 1971, pp. C6-219.
2. P. Zimmerman, T.W. Ducas, M.G. Littman, and D. Kleppner, "Stark Mixing Spectroscopy in Cesium," *Opt. Comm.* **12**, 1974, p. 198.
3. M.G. Littman, "Precise Calibration Method for Time-to-Amplitude Converters," *Rev. Sci. Inst.* **45**, 1974, p. 1068.
4. T.W. Ducas, M.G. Littman, R.R. Freeman, and D. Kleppner, "Stark Ionization of High Lying Levels of Sodium," *Phys. Rev. Lett.* **35**, 1975, p. 366.
5. T. W. Ducas, M.G. Littman, and M.L. Zimmerman, "Observations of Oscillations in Resonance Absorption from a Coherent Superposition of Atomic States," *Phys. Rev. Lett.* **35**, 1975, p. 1752.
6. M.G. Littman, M.L. Zimmerman, T.W. Ducas, R.R. Freeman, and D. Kleppner, "Structure of Sodium Rydberg States in Weak to Strong Electric Fields," *Phys. Rev. Lett.* **36**, 1976, p. 788.
7. T.W. Ducas, M.G. Littman, M.L. Zimmerman, and D. Kleppner, "Radiative Lifetimes of Selected Vibrational Levels in the <sup>1</sup>S<sub>u</sub> State of Na<sub>2</sub>," *J. Chem. Phys.* **65**, 1976, p. 842.
8. M.G. Littman, M.L. Zimmerman, and D. Kleppner, "Tunneling Rates for Excited States of Sodium in a Static Electric Field," *Phys. Rev. Lett.* **37**, 1976, p. 486.
9. M.L. Zimmerman, T.W. Ducas, M.G. Littman, and D. Kleppner, "Stark Structure of Barium Rydberg States," *J. Phys. B.* **11**, 1978, p. L11.

10. M.G. Littman and H.J. Metcalf, "Spectrally Narrow Pulsed Dye Laser Without Beam Expander," *Appl. Opt.* **17**, 1978, p. 2224.
11. M.G. Littman, M.M. Kash, and D. Kleppner, "Field Ionization Processes in Excited Atoms," *Phys. Rev. Lett.* **41**, 1978, p. 103.
12. M.G. Littman, "Single Mode Operation of Grazing Incidence Pulsed Dye Laser," *Opt. Lett.* **3**, 1978, p. 138.
13. M.L. Zimmerman, M.G. Littman, M.M. Kash, and D. Kleppner, "Stark Structure of the Rydberg States of Alkali-Metal Atoms," *Phys. Rev.* **A20**, 1979, p. 2251.
14. D. Kleppner, M.G. Littman, and M.L. Zimmerman, "Highly Excited Atoms," *Sci. Amer.* **244**, 1981, p. 130.
15. K. Liu and M.G. Littman, "Novel Geometry for Single-Mode Scanning of Tunable Lasers," *Opt. Lett.* **6**, 1981, p. 117.
16. J.R. Rubbmark, M.M. Kash, M.G. Littman, and D. Kleppner, "Dynamical Effects at Avoided Level Crossings--A Study of the Landau-Zener Effect Using Rydberg Atoms," *Phys. Rev. A* **23**, 1981, p. 3107.
17. D. Kleppner, M.G. Littman, and M.L. Zimmerman, "Rydberg Atoms in Strong Fields," in Rydberg States of Atoms and Molecules (Cambridge University Press, Cambridge), ed., R.F. Stebbings and R.B. Dunning, 1983.
18. M.G. Littman and W.D. Phillips, "A New Method for Measuring the Fine Structure Constant Using Stark Spectroscopy," in Precision Measurements and Fundamental Constants II. (National Bureau of Standards, Washington, D.C.), ed. B.N. Taylor and W.D. Phillips, Spec. Pub. No. 617, 1984.
19. M.G. Littman and E. Korevaar, "Atoms in Crossed Electric and Magnetic Fields," *J. de Phys.* **43**, 1982, p. C1-455.
20. E. Korevaar and M.G. Littman, "Effects of Crossed Electric and Magnetic Fields on Sodium Rydberg States," *J. Phys. B* **16**, 1983, p.L437.
21. M.G. Littman, "Single-Mode Pulsed Tunable Dye Laser," *Applied Optics* **23**, 1984, p. 4465.
22. C.W. Clark, E. Korevaar, and M.G. Littman, "Quasi-Penning Resonances of a Rydberg Electron in Crossed Electric and Magnetic Fields," *Phys. Rev. Lett.* **54**, 1985, p. 320.
23. M.G. Littman, R. Wotiz, and G. Blaha, "The Hornby Zero-One System for Microcomputer Control of Model Trains," *Model Railway Electronics* **1**, 1984, p. 90.

24. M.G., Littman, "Computerized Model Railroad at Princeton University," *Model Railway Electronics* **1**, No. 3, 1984, p. 88.
25. M.G. Littman, "Zeeman and Stark Effects," in The Encyclopedia of Physics, Van Nostrand, New York, ed., R.M. Besancon, 1985.
26. E. Korevaar and M.G. Littman, "Effects of Crossed Electric and Magnetic Fields on Atoms," in Atomic Excitation and Recombination in External Fields," Gordon and Breach, New York, eds., M.H. Nayfeh and C.W. Clark, 1985.
27. C.W. Clark, M.G. Littman, T.J. McIlrath, R. Miles, C.H. Skinner, S. Suckewer, and E. Valeo, "Possibilities for Achieving X-ray Lasing Action by Use of High-Order Multiphoton Processes," *J. Opt. Soc. Am. B* **3**, No. 3, 1986, p. 371.
28. D.M. Nosenchuck, M.G. Littman, and W. Flannery, "Two-Dimensional Nonsteady Viscous Flow Simulation on the Navier-Stokes Computer MiniNode," *J. of Scientific Computation*, **1**, No. 1, 1986, p. 53.
29. D.M. Nosenchuck and M.G. Littman, "The Navier-Stokes Computer," in Computational Mechanics, Ed., G. Noor, ASME, New York, 1986.
30. M.G. Littman, M.L. Zimmermann, T.W. Ducas, R.R. Freeman, and D. Kleppner, "Structure of Sodium Rydberg States in Weak to Strong Electric Fields," in Atoms in High Rydberg States, Ed., B. Dunning, AAPT, 1986. (Re-print of earlier paper--see Ref. 7.)
31. A. Gomez, M.G. Littman and I. Glassman, "Comparative Study of Soot Formation on the Centerline of Axisymmetric Laminar Diffusion Flames: Fuel and Temperature Effects," *Combustion and Flame* **70**, pp. 225-241, (1987).
32. M.G. Littman, "Excimer-Pumped Dye Laser," in Pulsed Single-Frequency Lasers: Technology and Applications, Ed. L. Rahn and W. Bischel, SPIE, Vol. 912, 1988, p. 56.
33. M.G. Littman and J. Montgomery, "Grazing-Incidence Designs Improve Pulsed Dye Lasers," *Laser Focus* **24**, No. 2, 1988, p. 70.
34. M.G. Littman, "Tunable Dye Lasers are Not Just For Physicists Anymore," *The Scientist* **2**, No. 10, 1988, p. 26.
35. M.E. Hayder, W.S. Flannery, M.G. Littman, D.M. Nosenchuck, and S.A. Orszag, "Large-Scale Turbulence Simulation on the Navier-Stokes Computer," *Computers and Structures*, **30**, No. 1/2, 1988, p. 357.
36. M.G. Littman, J. Gelfand, M. Liker, W. Stubbeman, J. Russakow, and C. McGee, "Electromechanical Analogs of Human Reflexes," *Ann. NY Acad. Sci.*, **563**, pp. 184-194 (1989).

37. M. Husman, C. Schwieters, M. Littman, and H. Rabitz, "Molecular Dynamics Simulator for Optimal Control of Molecular Motion," *Amer. J. of Physics*, **59** (11), 1991, p. 1012.
38. M.G. Littman, "Ophthalmoscope Device," *Optics and Photonics News*, **3**, 1992, p. 82.
39. L. Shen, S. Shi, C. Lin, M. Littman, H. Rabitz, and A. Weiner, "Optimal Control of the Electric Susceptibility of a Molecular Gas by Designed Non-resonant Laser Pulses of Limited Amplitude," *J. Chem. Phys.* **98**, p. 7792 (1993).
40. X. Wang and M.G. Littman, "Laser Cavity for Generation of Variable-Radius Rings of Light," *Optics Letters* **18**, p. 767 (1993).
41. P. Gross, V. Ramakrishna, E. Villalonga, H. Rabitz, M. Littman, M. Shayegan, and S. Lyon, "Optimally Designed Potentials for Control of Electron-Wave Scattering in Semiconductor Nano-devices," *Phys. Rev. B*, **49**, p.11,100 (1994).
42. D. Morris, C. Schwieters, M. Littman, and H. Rabitz, "A Molecular Dynamics Simulator for Optimal Control of Molecular Motion," *Amer. J. of Phys.* **62**, no.9, 817, 1994.
43. X. Ying, J.P. Lu, J.J. Heremans, M.B. Santos, M. Shayegan, S.A. Lyon, M. Littman, P.Gross and H. Rabitz, "Quantum reflection and transmission of ballistic two-dimensional electrons by a potential barrier", *Appl. Phys. Letter*. **65**, 1154 (1994).
44. X. Wang, M. G. Littman, J. B. McManus, M. Tadi, Y.S. Kim, A. Askar, and H. Rabitz, "Focused Bulk Ultrasonic Waves Generated by Ring-shaped Laser Illumination and Application to Flaw Detection," *Joul. Appl. Phys.* **80**, No. 8, p. 4274 (1996).
45. L. Shen, T-S. Ho, S. Shi, H. Rabitz, C. Lin, M. Littman, and A. Weiner, "Induced Transient Birefringence of a Resonantly Pumped Molecular Gas," *Joul. Chem. Phys.* **105**, No. 15, p. 6200 (1996).
46. M. K. Apostolos, M. Littman, S. Lane, D. Handelman, and J. Gelfand, "Robot Choreography; An Artistic-Scientific Connection," *Computers Math. Applic.*, **32**, No. 1 p. 1 (1996).
47. M.G. Littman and X. Wang, "Pulsed Lasers" in Atomic, Molecular, and Optical Physics, Vol. 29C of Experimental Methods in the Physical Sciences, Edited by F.B. Dunning and R.G. Hulet, p. 137 (1997).
48. J. Kasdin, R. Vanderbei, M. Littman, D. Spergel, "Extrasolar Planet Finding via Optimal Apodized-Pupil and Shaped-Pupil Coronagraphs" in The Astrophysical Journal, Vol. **582**, No. 2 (January 2003).
49. J. Kasdin, R. Brown, C. Burrows, S. Kilston, M. Kuchner, M. Littman, M. Noecker, S. Seager, D. Spergel, E. Turner, W. Traub, R. Vanderbei and R. Woodruff, "An

Optical/UV Space Coronagraph Concept for the Terrestrial Planet Finder”, Advances in Space Research, Volume 34, Number 3, 2004.

50. N.J. Kasdin, Robert J. Vanderbei, Michael G. Littman, and David N. Spergel, Optimal One-dimensional Apodizations and Shaped Pupils for Planet Finding Coronagraphy, *Appl. Opt.* **44**, issue 7, p. 1117 (2005)
51. M. G. Littman and Lucas Stern, “A New Understanding of the First Electromagnetic Machine: Joseph Henry’s Vibrating Motor” submitted to the *American Journal of Physics* (2010).

### **CONFERENCES:**

1. A.M. Gottlieb, M. Feldman, M. Littman and P. Heller, “Anisotropy and Temperature Dependence of the Zero Field Uniform Mode Relaxation Rate in  $\text{MnF}_2$  Near  $T_N^*$ ,” *Conference Proceedings*, **18**, part 2, Magnetism and Magnetic Materials, 1973, ed. by C.D. Graham and J.J. Rhyne, New York, 1974.
2. K.A. Smith and M.G. Littman, "Endpoint Position Control Using Biological Concepts," Proceedings of the 1993 International Symposium on Intelligent Control, Chicago, IL, August 1993.
3. M.G. Littman and D. Spergel, “A Gaussian Pupil Coronagraph: A New Approach to Detecting Terrestrial Planets”, American Astronomical Society Annual Meeting (Pasadena, CA), June 3 – 7 (2001).
4. J. Kasdin, R. Vanderbei, D. Spergel, and M. Littman, “Optimal shaped pupils for extrasolar planet detection” SPIE Proceedings (Vol. 4860) of the Conference on High-Contrast Imaging for Exo-Planet Detection, 23-26 August 2002 at Waikoloa, Hawaii.
5. M. G. Littman, M.Carr, J. Leighton, E. Burke, D. N. Spergel, J. Kasdin, Princeton Univ. “Control of optical phase and amplitude in a coronagraph using a Michelson interferometer”, SPIE Proceedings (Vol. 4854) of the Conference on Future EUV-UV and Visible Space Astrophysics Missions and Instrumentation, 22-23 August 2002 at Waikoloa, Hawaii.
6. J. Kasdin, R. Brown, C. Burrows, S. Kilston, M. Kuehner, M. Littman, M. Noecker, S. Seager, D. Spergel, E. Turner, W. Traub, R. Vanderbei and R. Woodruff, “An Optical/UV Space Coronagraph Concept for the Terrestrial Planet Finder”, World Space Congress, (Houston, Texas), COSPAR Poster No. E1.5-0020-02., (October 2002).
7. J. Kasdin, R. Vanderbei, M. Littman, D. Spergel, M. Carr, D. Mumm, and L. Pueyo, “Development and Testing of an Optimal Shaped Pupil Coronagraph for Extrasolar Planet Finding”, 201<sup>st</sup> AAS Meeting, (Seattle, WA), January 5-8 (2003).



8. J. Kasdin, M. Littman, A. Giveon, R. Vanderbei, D. Spergel, and M. Carr, "Optimal Shaped Pupils and Wavefront Control for Planet Finding Coronagraphy", Towards Other Earths: Darwin & TPF, (Heidelberg, Germany), (April 2003).
9. M. Littman, M. Carr, J. Kasdin, L. Pueyo, D. Spergel, and R. Vanderbei, "Amplitude and Phase Control of Pupil Coronagraph for Exo-planet Detection using Spatial Light Modulators", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5170-24, August 3-8 (2003).
10. Giveon, J. Kasdin, D. Spergel, M. Littman, R. Vanderbei, and P. Gurfil "Stochastic Optimal Phase Retrieval Algorithm for High-Dynamic Range Imaging", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5169-32, August 3-8 (2003).
11. Giveon, J. Kasdin, D. Spergel, M. Littman, R. Vanderbei, and P. Gurfil "Feasible Optimal Deformable Mirror Shaping Algorithm for High-Dynamic Range Imaging", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5169-33, August 3-8 (2003).
12. M. Lieber, S. Kilston, J. Kasdin, R. Vanderbei, and M. Littman, "Evolving Exosolar Planet Detection Methods with Lab Experiments and Integrated Modeling", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5170-09, August 3-8 (2003).
13. Giveon, J. Kasdin, D. Spergel, M. Littman, R. Vanderbei, and P. Gurfil, "Feasible Optimal Deformable Mirror Shaping Algorithm for High-Dynamic Range Imaging", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5169-33, August 3-8 (2003).
14. Giveon, J. Kasdin, D. Spergel, M. Littman, R. Vanderbei, and P. Gurfil, "Stochastic Optimal Phase Retrieval Algorithm for High-Dynamic Range Imaging", The International Symposium on Optical Science and Technology, SPIE's 48<sup>th</sup> Annual Meeting, Paper 5169-32, August 3-8 (2003).
15. J. Kasdin, R. Vanderbei, M. Littman, and D. Spergel, "Optimal Shaped Pupils for Planet Finding Coronagraphy", 203<sup>rd</sup> Annual Meeting of the American Astronomical Society, Poster 3.07, January 4-8 (2004).
16. Giveon, L. Pueyo, M. Littman, and R. Vanderbei, "Wavefront Estimation and Control Algorithms for High Contrast Imaging", 203<sup>rd</sup> Annual Meeting of the American Astronomical Society, Poster 3.02, January 4-8 (2004).
17. J. Kasdin, R. Vanderbei, M. Littman, M. Carr and D. Spergel, "The Shaped Pupil Coronagraph for Planet Finding Coronagraphy: Optimatization, Sensitivity, and Laboratory Testing", in Proceedings of SPIE Conference on Astronomical Telescopes and Instrumentation, 5487(63), 2004.
18. L. Pueyo, A. Give'on, M. Carr, M. Littman, J. Kasdin, R. Vanderbei, "High Dynamic Range Wavefront Stability: Amplitude and Phase Control", in

Proceedings of SPIE Conference on Astronomical Telescopes and Instrumentation, 5487(184), 2004.

19. A. Give'on, J. Kasdin, Y. Avitzour, R. Vanderbei, M. Littman, D. Spergel, "High-Frequency Folding and Optimal Phase Conjugation for High-Contrast Adaptive Optics", in Proceedings of SPIE Conference on Astronomical Telescopes and Instrumentation, 5487(155), 2004.
20. R. Belikov, J. Beall, M. Carr, A. Give'on, J. Kay, T. Kolade, M. Littman, F. Mycroft, L. Pueyo, R. Vanderbei, and N.J. Kasdin, Towards  $10^{10}$  Contrast for NASA's Terrestrial Planet Finder Mission: Demonstration of High Contrast in a Shaped-Pupil Coronagraph at Princeton, Proceedings of the International Astronomical Union, **1** p. 415 (2005)
21. N.J. Kasdin, R. Belikov, J. Beall, R. Vanderbei, M. Littman, M. Carr, and A Give'on, Shaped Pupil Coronagraphs for Planet Finding: Optimization, Manufacturing, and Experimental Results, Proceedings of the SPIE "Techniques and Instrumentation for Detection of Exoplanets II" (Coulter, Daniel, editor), **5905** p. 128 (2005)
22. L. Pueyo, M. Littman, N.J. Kasdin, R. Belikov, and A. Give'on, Chromatic Behavior of Amplitude and Phase Compensators, Proceedings of the International Astronomical Union, **1** p.435 (2005)
23. L. Pueyo, M. Littman, N.J. Kasdin, R. Vanderbei, R. Belikov, and A. Give'on, Chromaticity Effects in Adaptive Optics: Wavelength Dependence of Amplitude Compensation, Proceedings of the SPIE **5903**, (2005)
24. N. J. Kasdin, R. Belikov, E. Cady, M. Carr, J. Kay, M. Littman, L. Pueyo, R. J. Vanderbei, J. T. Trauger, K. Balasubramanian, P. Echternach, A. Give'on, A. Kuhnert, S. Shaklan, F. Shi, A. R. Neureuther, D. Ceperley, M. Miller, T. Shih, S. Kilston, M. Lieber, and J. Beall "Shaped Pupil Coronagraph: State of the Art and Projections for TPF Performance and Readiness" Coronagraph Workshop, Pasadena, CA, September 28-29, 2006, JPL Publication 07-02 (2006).