

# Sri Rama Prasanna Pavani

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## EXPERTISE

- *PhD thesis*: 3D Optical Nanoscopy
- Computational Optical Imaging
- Microscopy
- Optical Inspection and Metrology
- Photolithography
- Signal and Image Processing
- Optical System Design
- Super-resolution Imaging
- Extended Depth of Field Imaging

## AWARDS

- KLA-Tencor *Q410 discretionary award* (2010)
- *Outstanding PhD* dissertation, University of Colorado (2010)
- Marquis *Who's Who* in America (2010)
- Omnivision CDM Optics *PhD Fellowship* (2006 – 2009)
- *Outstanding paper* award, Optical Society of America (2008)
- *Best poster* award, Colorado Photonics Industry Association (2006, 2008)
- *SPIE scholarship* in Optical Science and Engineering (2008)
- *PhD Fellowship*, National University of Singapore (2005)
- *Gold Medal*, Government College of Technology - awarded to the topper of the class of 2003 (2003)
- Central Board of Secondary Education *scholarship* for excellence in Mathematics (1997)

## EDUCATION

- **Caltech**, Postdoctoral Scholar in Electrical Engineering (2009 – 2010)
- **Univ. of Colorado** at Boulder, PhD (*Outstanding PhD award*) in Electrical Engineering (2005 – 2009)
- **Univ. of Colorado** at Boulder, MS in Electrical Engineering (2005 – 2006)
- **GCT Coimbatore**, BE (*Gold Medalist*) in Electronics and Communication (1999 – 2003)

## EXPERIENCE

- **Ricoh Innovations**; *Research Scientist* (2010 – ongoing)  
Investigating the theory and application of advanced computational optical sensing and imaging systems
- **KLA-Tencor**; *Research Scientist* (2010)  
Developed optical sensing methods for nanometer scale defect detection in silicon, polysilicon, and SOI wafers
- **Caltech**; *Postdoctoral Scholar* (2009 – 2010)  
Developed optical imaging methods for three-dimensional imaging and phase imaging opto-fluidic microscopes
- **University of Colorado, Boulder**; *CDM Optics Fellow* (2005 – 2009)  
Invented a 3D superresolution nanoscope and a quantitative phase imaging microscope, and applied my inventions in 3D tracking, 3D velocimetry, 3D single molecule imaging, and optical metrology.
- **Stanford University**; *Visiting researcher* (2008)  
Demonstrated a breakthrough in optical nanoscopy by resolving two close molecules in three dimensions
- **Omnivision CDM Optics**; *Research Intern* (2006, 2007)  
Developed a new process for designing optical cameras that capture focused images of objects not in focus.
- **National University of Singapore**; *Research scholar* (2005)  
Studied face detection, expression detection, and 3D imaging algorithms
- **D. E. Shaw & Co.**; *Senior Member – Technical Staff* (2003 – 2005)  
Developed algorithms that help make investment decisions on D. E. Shaw's over \$20 billion (at that time) capital

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## PUBLICATIONS

### Journals

1. S. R. P. Pavani, J. DeLuca, R. Piestun, *Opt. Exp.* 17, 19644 (2009)
2. S. R. P. Pavani, M. Thompson, J. Biteen, S. Lord, N. Liu, R. Twieg, R. Piestun, W. E. Moerner *PNAS* 106, 2995 (2009)
3. S. R. P. Pavani, R. Piestun, *Opt. Exp.* 16, 22048 (2008)
4. S. R. P. Pavani, A. Greengard, R. Piestun, *Appl. Phys. Lett.* 95, 021103 (2009)
5. S. R. P. Pavani, R. Piestun, *Opt. Exp.* 16, 3484 (2008)
6. S. R. P. Pavani, A. R. Libertun, S. V. King, C. J. Cogswell, *Appl. Opt.* 47, 15 (2008)
7. G. Sharma, S. R. P. Pavani, R. Piestun, *Opt. Lett.* 35, 3306 (2010)
8. D. Conkey, ..., S. R. P. Pavani, and R. Piestun, *Opt. Exp.* *submitted* (2010)
9. S. V. King, C. Preza, S. R. P. Pavani, A. R. Libertun, C. J. Cogswell, R. Piestun, *to be submitted* (2010)

### Conferences

10. S. R. P. Pavani, J. DeLuca, R. Piestun, OSA BioMed (2010)
11. S. R. P. Pavani, R. Piestun, OSA FiO (2009)
12. S. R. P. Pavani\*, M. A. Thompson\*, J. S. Biteen, R. Piestun, W. E. Moerner, OSA NTM (2009)
13. S. R. P. Pavani, R. Piestun, OSA CLEO (2009)
14. S. R. P. Pavani, R. Piestun, SPIE Photonics West - BIOS **(INVITED)** (2009)
15. S. R. P. Pavani, R. Piestun, OSA FiO **(OUTSTANDING PAPER AWARD)** (2008)
16. S. R. P. Pavani, R. Piestun, OSA DH and 3D imaging (2008)
17. S. R. P. Pavani, R. Piestun, OSA FiO (2007)
18. S. R. P. Pavani, R. Piestun, OSA COSI (2007)
19. S. R. P. Pavani, A. R. Libertun, S. V. King, C. J. Cogswell, SPIE Photonics West -BIOS (2008)
20. S. R. P. Pavani, A. Libertun, C. J. Cogswell, OSA FiO (2007)
21. S. R. P. Pavani, A. Libertun, C. J. Cogswell, OSA COSI (2007)
22. S. R. P. Pavani, S. Balaji, T. H. Khezhi, and C. Vasanthanayaki, IEEE TENCON (2003)
23. S. R. P. Pavani, S. Balaji, T. H. Khezhi, and C. Vasanthanayaki, Computer Society of India (2003)
24. S. R. P. Pavani, R. Piestun, CPIA **(BEST POSTER AWARD)** (2009)
25. S. R. P. Pavani, A. Greengard, R. Piestun, CPIA (2007)
26. S. R. P. Pavani, A. Libertun, C. Cogswell, CPIA **(BEST POSTER AWARD)** (2006)
27. G. Sharma, S. R. P. Pavani, R. Piestun, OSA COSI (2009)
28. S. Quirin, S. R. P. Pavani, R. Piestun, OSA COSI (2009)
29. W. E. Moerner, Thompson, Lew, Badieirostami, Lord, Conley, Lee, Pavani, R. Piestun, COSI **(INVITED)** (2009)
30. M. A. Thompson\*, S. R. P. Pavani\*, J. S. Biteen, R. Piestun, W. E. Moerner, OSA CLEO (2009)
31. C. J. Cogswell, S. V. King, S. R. P. Pavani, D. B. Conkey, R. H. Cormack, Focus on Microscopy (2009)
32. S. Quirin, S. R. P. Pavani, R. Piestun, CPIA (2008)
33. G. Sharma, S. R. P. Pavani, R. Piestun, CPIA (2009)
34. G. Sharma, S. R. P. Pavani, R. Piestun, CLEO (2010)
35. S. Quirin, S. R. P. Pavani, R. Piestun, Digital Holography and 3D imaging (2010)
36. S. Quirin, S. R. P. Pavani, R. Piestun, ICCP MIT Media Lab (2010)
37. G. Sharma, S. R. P. Pavani, S. Quirin, J. G. DeLuca, R. Piestun, BNL (2010)
38. S. Quirin, S. R. P. Pavani, G. Sharma, R. Piestun, EOSAM, Parc Floral de Paris, France (2010)

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## INVITED TALKS

- **Caltech**; Biophotonics Laboratory (2009)
- **MIT**; Camera Culture Group (2009)
- **Yale University**; Soft Matter Lab and Levene Lab (2009)
- **Princeton University**; Lewis-Sigler Institute for Integrative Genomics (2009)
- **NIST**; Center for Nanoscale Science and Technology (2009)
- **University of Colorado**; COSI seminar (2009)
- **Government College of Tech.**; Optics education (2008)

## PATENTS

1. R. Piestun, S. R. P. Pavani, M. Thompson, J. Biteen, W. E. Moerner, U.S patent (*US20100278400*) (2010)
2. S. R. P. Pavani, C. Yang, U.S patent (*provisional*) (2010)
3. S. R. P. Pavani, J. Wu, C. Yang, U.S. patent (*provisional*) (2010)
4. S. R. P. Pavani, A. Libertun, S. King, C. Cogswell, U.S patent (*in review*) (2008)
5. S. R. P. Pavani and R. Piestun, U.S patent (*in review*) (2009)

## GRADUATE COURSES

- Advanced Optics Laboratory
- Fourier Optics and Holography
- Optical Electronics
- Physical Optics
- Nonlinear/Crystal Optics
- Optoelectronic System Design
- Quantum Optics
- Numerical Methods in Photonics
- Wavelets and Imaging
- Imaging Systems
- Nanophotonics
- Ultrafast Optics
- Digital Filtering
- Advanced Linear Systems
- Detection of Signal from Noise
- Noise and Random Processes
- Information Theory

## COMPUTER SKILLS

- MATLAB, C, C++, ZEMAX, Java, Perl, Visual Basic, CST, Adobe photoshop, Web designing, Shell scripting
- Windows, Mac, Linux, Solaris

## PROFESSIONAL ACTIVITIES

- **Program Committee**, OSA Applied Industrial Optics conference (2011)
- **Journal reviewer**, Optics Express, Optics Letters, Applied Optics, JOSA-A (2007– ongoing)
- **Grant reviewer**, OSA Jean Bennett student grant, OSAP youth science outreach grant (2010)
- **Member**, OSA, SPIE, Sigma Xi, Kavli Nanoscience Institute, ISTE (2005 – ongoing)
- **Grant writer**, obtained funding from SPIE to promote optics education (2008)
- **Practice PhD qualifying exam organizer**, conducted exams for 20 students at Univ. of Colorado (2007, 2008)
- **Mentor**, Piestun and Cogswell groups; trained first year PhD students (2007 – 2009)
- **Guest lecturer**, Fourier Optics; University of Colorado at Boulder (2006, 2008)
- **Teaching Assistant**, Advanced Optics Laboratory; University of Colorado at Boulder (2008)

## SOCIAL ACTIVITIES

- **Ex officio board member**, Environmental Center of the University of Colorado (2005 – 2006)
- **Member**, Blind-reader association; helped visually challenged students by reading their books aloud (1993 – 1999)
- **Member**, Live'n'Give; A philanthropic organization that funds underprivileged students (2007 – ongoing)
- **Donor**, donated all of my prize money to help visually/financially challenged students (2005 – ongoing)