

Peter J. Lu

陸述義

<http://www.peterlu.org/>

- Contact** Department of Physics, Harvard University, 17 Oxford Street, Cambridge, MA 02138 USA
email: plu@fas.harvard.edu; phone: (617) 496-8915
- Personal** Born 1978 (Ohio, USA); dual citizenship in the United States of America and in Canada
- Education** A.B. *summa cum laude* (2000), Physics, Princeton University; GPA: 4.13 (departmental), 4.04 (overall)
A.M. (2002) and Ph.D. (2008), Physics, Harvard University (advisor: Prof. David A. Weitz)

Publications

Refereed Journal Articles

[listed by journal impact factor]

16. Peter J. Lu, Emanuela Zaccarelli, Fabio Ciulla, Andrew B. Schofield, Francesco Sciortino and David A. Weitz, "Gelation of particles with short-range attraction," *Nature* **453**, 499-503 (2008).
15. Luca Binda, Paul J. Steinhardt, Nan Yao and Peter J. Lu, "Natural Quasicrystals," *Science* **324**, 1306-1309 (2009).
14. Peter J. Lu and Paul J. Steinhardt, "Decagonal and Quasi-Crystalline Tilings in Medieval Islamic Architecture," *Science* **315**, 1106-1110 (2007).
13. Peter J. Lu, "Early Precision Compound Machine from Ancient China," *Science* **304**, 1638 (2004).
*discovery highlighted in: "Archaeology: Eastern Hemisphere," *Encyclopædia Britannica, 2005 Book of the Year*, p. 150.
12. Peter J. Lu, Motohiro Yogo and Charles R. Marshall, "Phanerozoic Marine Biodiversity Dynamics in light of the Incompleteness of the Fossil Record," *Proc. Nat. Acad. Sci. USA* **103**, 2736-2739 (2006).
11. Peter J. Lu, Jacinta C. Conrad, Hans M. Wyss, Andrew B. Schofield and David A. Weitz, "Fluids of Clusters in Attractive Colloids," *Phys. Rev. Lett.* **96**, 028306 (2006).
10. Peter J. Lu, Kenneth Deffeyes, Paul J. Steinhardt and Nan Yao, "Identifying and Indexing Icosahedral Quasicrystals from Powder Diffraction Patterns," *Phys. Rev. Lett.* **87**, 275507 (2001).
9. Peter J. Lu, Weitao Pan and Maitland Jones, Jr., "Benzocyclohex-1-en-3-yne at High Temperature," *J. Am. Chem. Soc.* **120**, 8315-8318 (1998).
8. Peter J. Lu, Peter A. Sims, Hidekazu Oki, James B. Macarthur and David A. Weitz, "Target-locking Acquisition with Real-time Confocal (TARC) Microscopy," *Optics Express* **15**, 8702-8712 (2007).
7. Emanuela Zaccarelli, Peter J. Lu, Fabio Ciulla, David A. Weitz and Francesco Sciortino, "Gelation as arrested phase separation in short-ranged attractive colloid-polymer mixtures," *J. Phys.: Condens. Matter* **20**, 494242 (2008).
6. A. S. Risbud, K. B. Helean, M. C. Wilding, P. Lu and A. Navrotsky, "Enthalpies of formation of lanthanide oxyapatite phases," *J. Mater. Res.* **16**, 2780-2783 (2001).
5. Peter J. Lu, Nan Yao, Jenny F. So, George E. Harlow, Jianfang Lu, Genfu Wang and Paul M. Chaikin, "Earliest Use of Corundum and Diamond in Prehistoric China," *Archaeometry* **47**, 1-12 (2005).
4. Juan-Jose Lietor Santos, Chanjoon Kim, Peter J. Lu, Alberto Fernandez-Nieves and David A. Weitz, "Gravitational Compression of Colloidal Gels," *Eur. Phys. J. E* DOI 10.1140/epje/i2008-10390-7 (2009).

Invited Publications

3. Peter J. Lu, "The blossoming of Japanese mathematics," *Nature* **454**, 1050 (2008).
2. Peter J. Lu and Paul J. Steinhardt, "Further Notes on Quasi-Crystal Tilings," *Science* **316**, 981 (2007).
1. Peter J. Lu, "Confocal Scanning Optical Microscopy and Nanotechnology," in *Handbook of Microscopy for Nanotechnology*, N. Yao and Z. L. Wang eds., New York: Kluwer, pp. 3-24 (2005) & Beijing: Tsinghua University Press, pp. 1-23 (2006).

Patent

- Peter J. Lu, "Target-locking Acquisition with Real-Time Confocal (TARC) Microscopy,"
U.S. Provisional Patent Application, Serial Number 60/932,396, filed on May 31, 2007.

General-Audience Media Coverage

Radio broadcasts

- "Islamic art," *The World Today*, BBC World Service, 24 Feb 2007, 0700 and 0800 GMT (UK).
*accompanying web story was the overall most-emailed story for 60 hours at the <http://news.bbc.co.uk> website.
- "Medieval Mosques Illuminated by Math," *All Things Considered*, National Public Radio, 22 Feb 2007, 5 PM EST (USA).
"Advanced Stone-Polishing Techniques Employed Earlier Than Thought," *All Things Considered*, National Public Radio, 7 Mar 2005, 5 PM EST (USA).

Newspaper articles

- "Lo que vio Mrs. Penrose," *Revista de Agosto, El Pais*, 7 Aug 2007, p. 19 (Spain).

▶ denotes front-page coverage]

- “L’art des mosquées devance les maths,” *El Watan*, 8-9 Jun 2007, p. 19 (Algeria).
- ▶ “Эътирофни беш аср кутган ихтиро,” *Халк сўзи*, 29 March 2007, p. 1 (Uzbekistan).
 - ▶ “Мозаика Пенроуза,” *Правда Востока*, 24 March 2007, p. 1 (Uzbekistan).
 - “Mathematik und Kunst beim Plattenlegen,” *Neue Zürcher Zeitung am Sonntag*, 18 Mar 2007, p. 76 (Switzerland).
 - ▶ “Matematiker fann koden till islamska mönster,” *Dagens Nyheter*, 4 Mar 2007, p. 18 (Sweden).
 - “The maths is on the wall,” *The Canberra Times*, 4 Mar 2007, p. 6 (Australia).
 - “Kvazikristalna geometrija. Tajne srednjovjekovne islamske umjetnosti,” *Feral Tribune*, 2 Mar 2007, p. 39 (Croatia).
 - “Muster ohne Wiederholung,” *Die Zeit*, 1 Mar 2007, p. 38 (Germany).
 - “Medieval Islamic Architecture Predates Western Mastery,” *Iran Daily*, 28 Feb 2007, p. 12 (Iran).
 - ▶ “Modern math in medieval tiles,” *International Herald Tribune*, 28 Feb 2007, p. 4 (France).
 - ▶ “In Medieval Architecture, Signs of Advanced Math,” *The New York Times*, 27 Feb 2007, p. F2 (USA).
 - “Symetria zagubiona na pół tysiąca lat,” *Gazeta Wyborcza*, 27 Feb 2007, p. 24 (Poland).
 - ▶ “Science Imitates Art?” *The Boston Globe*, 26 Feb 2007, p. C1 (USA).
 - “Patterns of Islamic genius crystal clear centuries ago,” *Sydney Morning Herald*, 26 Feb 2007, p. 5 (Australia).
 - “Matemática muito ‘à frente’ explica mosaicos islâmicos,” *Diário de Notícias*, 26 Feb 2007 (Portugal).
 - “Islamische Ornamente,” *Neue Zürcher Zeitung am Sonntag*, 25 Feb 2007, p. 74 (Switzerland).
 - ▶ “Medieval Islamic artists made amazing maths breakthrough,” *Gulf News*, 24 Feb 2007, p. 1 (United Arab Emirates).
 - ▶ “Medieval Muslims made stunning math breakthrough,” *Today’s Zaman*, 24 Feb 2007, p. 11 (Turkey).
 - ▶ “Early Muslims made amazing math inventions,” *The Brunei Times*, 24 Feb 2007, p. 1 (Brunei).
 - “Medieval Muslims made stunning maths breakthrough,” *The Times of India* [New Delhi], 24 Feb 2007, p. 19 (India).
 - “Medieval Muslims made stunning breakthrough,” *Bahrain Tribune*, 24 Feb 2007, p. 11 (Bahrain).
 - “Old Tiles reflect Muslim’s maths mastery,” *Straits Times*, 24 Feb 2007, p. 25 (Singapore).
 - “Designs from Islamic artists streets ahead of West,” *New Zealand Herald*, 24 Feb 2007, p. B10 (New Zealand).
 - “Los mosaicos árabes, geometría de avanzada” *La Nacion*, 24 Feb 2007, p. 20 (Argentina).
 - ▶ “New Light on ancient patterns,” *Chicago Tribune*, 23 Feb 2007, p. 12 (USA).
 - ▶ “Amazing maths of the mosaic makers,” *The Times*, 23 Feb 2007, p. 29 (Britain).
 - “Islamic tilers may have led scientific field,” *The Daily Telegraph*, 23 Feb 2007, p. 17 (Britain).
 - “Islamic artists were 500 years ahead of Western scientists,” *The Independent*, 23 Feb 2007, p. 24 (Britain).
 - “Medieval math feat,” *The Telegraph of India*, 23 Feb 2007 (India).
 - “Muslim Tiles Patterns Show Math Prowess,” *The Washington Post*, 23 Feb 2007, p. A10 (USA).
 - “Modern mathematicians are 500 years behind,” *The Globe and Mail*, 23 Feb 2007, p. A18 (Canada).
 - “The art of repetition,” *National Post*, 23 Feb 2007, p. A16 (Canada).
 - “El arte de las matemáticas,” *ABC*, 23 Feb 2007, p. 79 (Spain).
 - “이슬람 문양 규칙성 찾았다… “4, 5개 단위로 묶으면 패턴” ,” *Donga*, 23 Feb 2007 (South Korea).
 - “Geometrische Schönheiten,” *Berliner Zeitung*, 23 Feb 2007, p. 13 (Germany).
 - “Diamant und Korund in Chinas Jungsteinzeit,” *Neue Zürcher Zeitung am Sonntag*, 1 Jun 2005, p. 59 (Switzerland).
 - “Chinese First to Use Diamond,” *Iran Daily*, 21 May 2005, p. 12 (Iran).
 - “The high tech of prehistory,” *The Christian Science Monitor*, 3 Mar 2005, p. 16 (USA).
 - “Earliest known use of diamond, sapphire by prehistoric Chinese found,” *New Light of Myanmar*, 20 Feb 05, p. 12 (Burma).
 - ▶ “Earliest use of diamonds by prehistoric Chinese found,” *中國日報 [China Daily]*, 18 Feb 2005, p. 1 (China).

Magazine articles

- “Высшая математика ислама,” *Gallery*, Apr 2007, p. 100 (Ukraine).
- “Islam Got It First,” *Newsweek* [Intl Ed.], 19 Mar 2007, p. 42 (USA).

Selected Science-Focused Media Coverage

Television broadcast

- “Tuiles de l’Islam,” *Découverte*, Canadian Broadcasting Company, 23 Sep 2007, 1830 EDT (Canada).

Radio broadcasts

- “Quasikristalle in orientalischen Ornamenten,” *Forschung Aktuell*, Deutschlandfunk, 26 Feb 2007, 1630 GMT (Germany).
- “Chinese Stone Axes,” *Quirks and Quarks*, CBC/Radio-Canada, 9 Apr 2005, 12 PM EDT (Canada).

Magazine articles

- “Natural quasicrystal found in a museum specimen,” *Physics Today*, August 2009, p. 14 (2009).
- “Mauren mauerten symmetrisch,” *Geo*, Oct 2008 (Germany).
- “The End of an Intellectual Dark Age?,” *Science*, 23 May 2008, p. 1004 (USA).
- “The Top 100 Science Stories of 2007: 59. Math Breakthrough Spotted on Mosques,” *Discover*, Jan 2008, p. 53 (USA).
- “Islamitsche kunst var ren matematik,” *Illustreret Videnskab*, Oct 2007, p. 20 (Denmark; Sweden; Norway).

- “Matematiikkaa moskeijan seinässä,” *Tieteen Kuvalehti*, Oct 2007, p. 20 (Finland).
- “Islamische kunst: pure wiskunde,” *Wetenschap in Beeld*, 1/2007, p. 20 (The Netherlands).
- “Moderne Mathematik in islamischen Ornamentem,” *Spektrum der Wissenschaft*, Sep 2007, p. 14 (Germany).
- “Zakazana Symetria Patelni,” *Focus Historia*, 3/2007, p. 18 (Poland).
- “中世イスラムの準結晶,” 日経サイエンス [*Scientific American, Japanese edition*], Jul 2007, p. 16 (Japan).
- “Intuition: Die Macht des Unbewussten,” *Süddeutsche Zeitung Wissen*, May/June 2007, p. 47 (Germany).
- “Medieval Quasicrystals,” *Scientific American*, May 2007, p. 36 (USA).
- “Quasikristalline islamische Muster,” *Spektrum der Wissenschaft*, May 2007, p. 10 (Germany).
- “Los secretos matemáticos de los edificios islámicos,” *Clio*, Apr 2007 (Spain).
- “Islamic tilers got it long before Penrose,” *New Scientist*, 3 Mar 2007, p. 18 (UK).
- “Revised Numbers Quicken the Pace of Rebound from Mass Extinctions,” *Science*, 17 Feb 2006, p. 931 (USA).
- “Kivikauden kirveitä kiillotettiin jalokivillä,” *Tieteen Kuvalehti*, 12 May 2005, p. 22 (Finland).
- “Des haches polies au diamant,” *Pour La Science*, Apr 2005, p. 15 (France).
- “Steinzeitliche Diamantschleifer,” *Spektrum der Wissenschaft*, Apr 2005, p. 14 (Germany).
- “Premiers outils durs,” *Le Recherche*, Apr 2005, p. 19 (France).
- ▶ “In the Buff: Stone Age tools may have derived luster from diamond,” *Science News*, 19 Feb 2005, p. 116 (USA).
- “2500 Jahre alte Maschine aus China,” *Abenteuer Archäologie*, 3/2004, p. 8 (Germany).
- “古代中国の進んだ工作機械,” 日経サイエンス [*Scientific American, Japanese edition*], Oct 2004, p. 17 (Japan).
- “First Compound Machine Found in China,” *Popular Mechanics*, Sep 2004, p. 18 (USA).
- “Spirales Chinoises,” *La Recherche*, Sep 2004, p. 21 (France).
- “Tilsimli Yüzük,” *Atlas Geographic*, Sep 2004, p. 37 (Turkey).
- “不「成器」, 怎琢玉,” 本文出自科學人 [*Scientific American, Chinese edition*], Sep 2004, p. 21 (Taiwan).
- “Machine Made,” *Scientific American*, Aug. 2004, p. 29 (USA).

Invited Lectures

80. NVIDIA GPU Technology conference, San Jose, CA; 1 Oct 2009.
- 76-79. Complex Fluids summer school, Universidad Autonoma de San Luis Potosi, San Luis Potosi, Mexico; 17-21 Aug 2009.
75. NNIN/C workshop: Programming the GPU, Center for Nanoscale Systems, Harvard University, Cambridge MA; 14 Aug 2009.
74. Biomedical Optics Lecture Series, Harvard-MIT Health Sci. & Tech., Massachusetts General Hospital, Boston, MA; 1 Jul 2009.
73. Nanoscience seminar, Institute for Physics, Göteborgs Universitet, Göteborgs, Sweden; 15 Jun 2009.
72. Department of Information Technology, University West, Trollhättan, Sweden; 10 Jun 2009.
71. Innovatum Science Center, Trollhättan, Sweden; 9 Jun 2009.
70. *Colloquium*, Van der Waals-Zeeman Institute, University of Amsterdam, Amsterdam, The Netherlands; 5 Jun 2009.
69. American Physical Society March Meeting, Pittsburgh, PA; 19 Mar 2009.
68. 47th AIAA Aerospace Sciences Meeting, Orlando, FL; 6 Jan 2009.
67. Institute for Physical Chemistry, Albert-Ludwigs-Universität, Freiburg, Germany; 19 Dec 2008.
66. Institut für Physik, Johannes-Gutenberg-Universität, Mainz, Germany; 18 Dec 2008.
65. Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy; 1 Dec 2008.
64. Award lecture, Final Meeting, European Union Marie Curie Network on Dynamical Arrest, Taormina, Sicily; 26 Nov 2008.
63. *Colloquium*, National Research Council Canada, Ottawa, ON; 25 Sep 2008.
62. Fluid Mechanics Conference 7, European Mechanical Society, University of Manchester, Manchester, UK; 15 Sep 2008.
61. Annual Meeting, American Bar Association, New York, NY; 8 Aug 2008.
60. Department of Physics, Università di Napoli, Napoli, Italy; 12 June 2008.
59. Department of Physics, Università degli Studi di Roma “La Sapienza,” Roma, Italy; 10 Jun 2008.
58. Department of Physics, Georgetown University, Washington, DC; 2 Jun 2008.
57. Department of Fundamental Engineering, Institute of Industrial Science, The University of Tokyo, Tokyo, Japan; 22 May 2008.
56. Samarkand State University, Samarkand, Uzbekistan; 8 May 2008.
55. Urgench State University, Urgench, Uzbekistan; 6 May 2008.
54. 10th Anniversary Conference, Harvard University Asia Center, Cambridge, MA; 2 May 2008.
53. Department of Physics, McGill University, Montréal, QC, Canada; 27 Mar 2008.
- 51, 52. *Colloquium* and seminar, Department of Physics, Case Western Reserve University, Cleveland, OH; 28 Feb 2008.
50. Annual Meeting, American Association for the Advancement of Science (AAAS), Boston, MA; 16 Feb 2008.
49. Workshop: Crystallization & Jamming in Soft Matter under Driving, Lorentz Center, Leiden, The Netherlands; 12 Feb 2008.
48. Institute of Materials Physics in Space, German Aerospace Center (DLR), Köln, Germany; 8 Feb 2008.
47. *Colloquium*, Department of Physics, Harvard University, Cambridge, MA; 3 Dec 2007.
46. Iranian Association of Boston, Watertown, MA; 7 Nov 2007.
45. Iranian Academy of Arts, Tehran, Iran; 14 Jun 2007.
44. Conference: Practical & Scientific Course for Cultural Management, Ministry of Education, Tehran, Iran; 14 Jun 2007.
43. Islamic & Iranian Culture & Civilization Committee, Supreme Revolutionary Council for Culture, Tehran, Iran; 13 Jun 2007.
42. Department of Physics, Isfahan University, Isfahan, Iran; 11 Jun 2007.

41. Department of Physics, Sharif University of Technology, Tehran, Iran; 9 Jun 2007.
 - 39, 40. Department of Physics, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran; 2 Jun 2007 and 3 Jun 2007.
 37. Department of Physics, Tarbiat Modarres University, Tehran, Iran; 29 May 2007.
 - 36, 38. Department of Physics, Iman Khomeini International University, Qazvin, Iran; 28 May 2007 and 30 May 2007.
 35. Foreign Office Architects, London, Great Britain; 25 May 2007.
 34. Center for Middle Eastern Studies, Harvard University, Cambridge, MA; 14 Apr 2007.
 33. Graduate School of Design, Harvard University, Cambridge, MA; 13 Apr 2007.
 32. Dipartimento di Fisica, Università degli Studi di Milano, Milano, Italy; 25 Jan 2007.
 31. Institute for Theoretical Physics II, Heinrich-Heine-Universität, Düsseldorf, Germany; 19 Jan 2007.
 30. Workshop: Confocal Microscopy, New England Society for Microscopy Symposium, Woods Hole, MA; 4 May 2006.
 29. Institute for Theoretical Physics, Universität Leipzig, Leipzig, Germany; 21 Apr 2006.
 28. German Research Centre for Geosciences (GeoForschungsZentrum), Potsdam, Germany; 20 Apr 2006.
 27. Fraunhofer-Institute for Surface Engineering and Thin Films (Fraunhofer-IST), Braunschweig, Germany; 18 Apr 2006.
 26. Laboratory of Colloids, Glasses and Nanomaterials, Université Montpellier II, Montpellier, France; 12 Apr 2006.
 25. Department of Nuclear Engineering, Politecnico di Milano Technical University, Milano, Italy; 11 Apr 2006.
 24. Institute of Polymers, Materials Department, ETH-Hönggerberg (Swiss Federal Inst. of Tech.), Zürich, Switzerland; 5 Apr 2006.
 23. Debye Institute, Utrecht University, Utrecht, The Netherlands; 31 Mar 2006.
 22. FOM–Institute for Atomic and Molecular Physics (AMOLF), Amsterdam, The Netherlands; 30 Mar 2006.
 21. Van der Waals–Zeeman Institute, University of Amsterdam, Amsterdam, The Netherlands; 29 Mar 2006.
 20. *East Asian Archaeology Seminar*, Department of Anthropology, Harvard University, Cambridge, MA; 9 Feb 2006.
 19. *Colloquium*, Department of Physics, Hong Kong Baptist University, Hong Kong; 15 Nov 2005.
 18. Joint Seminar, Departments of Physics and of Fine Arts, The Chinese University of Hong Kong, Hong Kong; 14 Nov 2005.
 17. Department of Physics, Academia Sinica, Taipei, Taiwan; 11 Nov 2005.
 16. *Colloquium*, Department of Physics, Hong Kong University of Science and Technology, Hong Kong; 10 Nov 2005.
 15. Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou, China; 7 Nov 2005.
 14. Harvard University Asia Center, Harvard Club of New York, New York, NY; 14 Jun 2005.
 13. Turkmen Polytechnic Institute, Ashgabat, Turkmenistan; 17 Mar 2005.
 12. Mary Energy Institute, Mary, Turkmenistan; 16 Mar 2005.
 11. Miras National Cultural Center of Turkmenistan, Ashgabat, Turkmenistan; 15 Mar 2005.
 10. Science Department, Turkmen State University, Ashgabat, Turkmenistan; 15 Mar 2005.
- *First science lecture presented in Turkmenistan by a foreign researcher after the fall of the Soviet Union.
9. Supreme Council on Science and Technology of Turkmenistan, Ashgabat, Turkmenistan; 15 Mar 2005.
 8. Institute of History of Turkmenistan, Ashgabat, Turkmenistan; 14 Mar 2005.
 7. Department of Theoretical Physics, Hahn-Meitner Institut, Berlin, Germany; 11 Mar 2005.
 6. Department of NanoBiophotonics, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany; 4 Feb 2005.
 5. Department of Physics, Università degli Studi di Roma “La Sapienza,” Roma, Italy; 31 Jan 2005.
 4. Institute for the History of Science, Chinese Academy of Sciences, Beijing, China; 24 Aug 2004.
 3. NASA Space Station Program Control Board, NASA Johnson Space Center, Houston, TX; 10 Aug 2004.
 2. Conference: Archaic Jades across the Taiwan Strait, Taipei, Taiwan; 21 Sep 2001.
 1. International Center for Diffraction Data, Newtown Square, PA; 15 Mar 2001.

Selected Appointments, Honors and Awards

- Early Stage Researcher Prize, European Commission Marie Curie Actions: Research Training Network on Dynamical Arrest (2008).
- Visiting Scholar, Academy of Sciences of Uzbekistan, Tashkent, Uzbekistan (2008).
- Visiting Professor, Imam Khomeini International University, Qazvin, Iran (2007).
- Advisory Committee, National Science Olympiad (2007-present).
- Speakers and Specialists Grant, Bureau of International Information Programs, U.S. Department of State (2005).
- National Defense Science and Engineering Graduate Fellowship (2000-03).
- Phi Beta Kappa and Sigma Xi, Princeton University (2000).
- Princeton University Kusaka Memorial Prize [highest-ranked physics undergrad] (2000).
- National Science Foundation Graduate Fellowship [declined] (2000).
- Barry M. Goldwater Scholarship (1998).
- National Science Olympiad: seven national gold medals, 50 total medals (1990-96).
- National Latin Exam: gold medal (1995).