

Alexander D. Wissner-Gross, Ph.D.

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Overview

Dr. Alexander D. Wissner-Gross is an Institute Fellow at the Harvard University Institute for Applied Computational Science and a Research Affiliate at the MIT Media Laboratory. He has received 105 major distinctions, authored 14 publications, been granted 15 issued, pending, and provisional patents, and founded, managed, and advised 7 companies. In 1998 and 1999, he won the U.S.A. Computer Olympiad and the Intel (formerly Westinghouse) Science Talent Search. In 2003, he became the last person in MIT history to receive a triple major, with bachelors in Physics, Electrical Science and Engineering, and Mathematics, while graduating first in his class from the MIT School of Engineering. In 2007, he completed his Ph.D. in Physics at Harvard University, where his research on smart matter, pervasive computing, and machine learning was awarded the Hertz Doctoral Thesis Prize. Following his Ph.D., he was named a Ziff Fellow in Computer Science at Harvard University. His work has been featured in Technology Review, BusinessWeek, Scientific American, The New York Times, and The Wall Street Journal.

Industrial Experience

- 2012-Present Executive Committee Member, InTouch LLC
- 2011-Present Scientific Advisory Board Member, The Cure Is Now Inc.
- 2011-Present Founder, Gemedi, Inc.
- 2011-Present Scientific Advisory Board Member, Personalized Medicine, LLC
- 2011-Present Advisory Board Member, Hibernia Atlantic U.S., LLC
- 2009-2011 Advisory Board Member, Global Green Consulting Group, Inc.
(acquired by Cloud Technology Partners, Inc., in 2011)
- 2008-Present Founder, Enernetics, Inc.

Academic Experience

- 2012-Present Institute Fellow, Institute for Applied Computational Science, Harvard University
- 2010-Present Research Affiliate, Media Laboratory, Massachusetts Institute of Technology
- 2008-2010 Ziff Fellow, Computer Science, Harvard University

Education

- 2003-2008 Ph.D., Physics, Harvard University (completed 2007; Hertz Thesis Prize Winner)
A.M., Physics, Harvard University
- 1999-2003 S.B., Physics, Massachusetts Institute of Technology
S.B., Electrical Science and Engineering, Massachusetts Institute of Technology
S.B., Mathematics, Massachusetts Institute of Technology
(1st out of ~550 in MIT School of Engineering class as Henry Ford II Scholar)
- 1995-1999 Great Neck South High School, Great Neck, NY (1st out of 225)

Distinctions

- 2012 Certificate of Recognition, Harvard Institute for Applied Computational Science
- 2011 Elected Member of the Philosophical Society of Washington
- 2011 Nominee, Forbes 30 Under 30 Rising Stars of Science
- 2010 Science News of the Year (Technology), Society for Science & the Public
- 2009 Featured Young Innovator, NSF National Science Board
- 2009 Certificate of Appreciation, IEEE Computer Society of Connecticut
- 2008 Finalist, Crunchies Startup Awards (“Most Likely to Make the World a Better Place”)
- 2008 Hertz Doctoral Thesis Prize Winner, Fannie and John Hertz Foundation
- 2008 Featured Entrepreneur, MIT Chairman's Salon
- 2008 Y Combinator Founder (Summer 2008)
- 2008 Winner, Summer@Highland Entrepreneurship Program (declined)
- 2008 Ziff Environmental Fellowship, Harvard University Center for the Environment
- 2007 Harold T. White Prize for Excellence in Teaching, Harvard Physics Department
- 2007 Nominee, Derek C. Bok Award for Excellence in Graduate Student Teaching of Undergraduates
- 2007 Dan David Prize Scholarship for Future Energy applications, Tel Aviv University
- 2007 Graduate Student Silver Award, Materials Research Society
- 2006 Finalist, named one of top 6 directors in amateur category, Materials Research Film Festival
- 2006 Nanotechnology paper selected for Institute of Physics Journal Highlights
- 2006 Book Prize, Harvard's Derek Bok Center for Teaching and Learning
- 2006 Harvard University Certificate of Distinction in Teaching
- 2006 Nominee, Harvard's Joseph R. Levenson Memorial Teaching Prize (only Physics nominee)
- 2004 First place (5km race) and Second place (500m race) team in division, Jichuan Cup International Dragon Boat Invitational Tournament for University Students in Tianjin, China
- 2003 Harvard Purcell Fellowship
- 2003 Malcolm Cotton Brown Award as top ranked MIT senior pursuing experimental physics
- 2003 Elected to Sigma Xi (scientific research) honor society
- 2003 Elected to Sigma Pi Sigma (physics) honor society
- 2003 Elected to Phi Beta Kappa (arts and sciences) honor society
- 2003 Runner-Up, Stanford Entrepreneur's Challenge
- 2003 Finalist, MIT \$50K Entrepreneurship Competition
- 2003 Henry Ford II Scholar Award, MIT School of Engineering
- 2003 Fannie and John Hertz Foundation Fellowship
- 2003 One of 20 named to USA Today All-USA 1st Academic College Team
- 2003 National Defense Science and Engineering Graduate Fellowship (declined)
- 2003 DOE Computational Science Graduate Fellowship (declined)
- 2003 NSF Graduate Research Fellowship (declined)
- 2003 Stanford Graduate Fellowship (declined)

2003 Caltech Richard P. Feynman Fellowship (declined)
 2003 Yale Leigh Page Prize (declined)
 2002 British Marshall Scholarship (declined)
 2002 Winner in Tiny Technologies Category, MIT \$1K Entrepreneurship Competition
 2002 Elected to Tau Beta Pi (engineering) honor society
 2002 Elected to Eta Kappa Nu (electrical & computer engineering) honor society
 2002 First place nationally, Inaugural Intel Undergraduate Research Award
 2001 Barry M. Goldwater Scholar
 2001 Letters of commendation (top 2%) in 3 of the 4 core MIT EECS courses
 2000 Director's Award, MITRE Corporation
 2000 National Dean's List
 1999 National Winner, New Technology, NITA Young Inventors & Creators Competition
 1999 American Academy of Achievement's Salute to Excellence (personally sponsored by Lemelson Foundation)
 1999 First place nationally, American Scholastic Mathematics Association (ASMA)
 1999 Honorable Mention, First Step to Nobel Prize in Physics
 1999 Valedictorian, Great Neck South High School
 1999 National Winner, 10th Place, Intel Science Talent Search
 1999 Inducted into National Young Inventors' Hall of Fame, National Gallery for America's Young Inventors
 1999 One of 20 named to USA Today All-USA 1st Academic High School Team
 1999 Lucent Global Science Scholar
 1999 United States Navy Science Achievement Award
 1999 Tandy Technology Scholar
 1999 Grand Prize Winner, USA Math Talent Search (USAMTS)
 1999 First Place, Army Physics Award, International Science and Engineering Fair (ISEF)
 1999 Intel Best Use of PC Award, International Science and Engineering Fair (ISEF)
 1999 Second Place, Physics Grand Award, International Science and Engineering Fair (ISEF)
 1999 Second Place, Air Force Physics Award, International Science and Engineering Fair (ISEF)
 1999 American Association of Physics Teachers Award, International Science and Engineering Fair (ISEF)
 1999 Citation for Excellence, Nassau County Legislature
 1999 International Honor Winner, Canadian Open Mathematics Challenge
 1999 Honored Scholar, National Alliance for Excellence
 1999 National AP Scholar
 1999 National Merit Finalist
 1998-1999 Who's Who Among American High School Students
 1998-1999 First place in Senior Division with perfect score, American Computer Science League (ACSL)
 1998 Member of U.S. team at International Olympiad in Informatics (IOI)
 1998 Second place nationally, USA Computer Olympiad Finals
 1998 First place individual, Fall Open Competition of USA Computer Olympiad

- 1998 First place nationally with perfect score, USA Math Talent Search (USAMTS)
- 1998 Winner and top-scoring American, Email Informatics Competition (EIC)
- 1998 Winner, Long Island Software Award
- 1998 Highest Scoring Student Award, American Scholastic Mathematics Association (ASMA)
- 1998 George Washington University School of Engineering & Applied Science Medal
- 1998 National Winner, Computer Science, NITA Young Inventors & Creators Competition
- 1998 Third place American and 14th place internationally, Central European Olympiad in Informatics (CEOI)
- 1998 First place out of 20,000 students with perfect score, Canadian Mathematics Fermat Competition
- 1998 First Place, C++, Continental Math League Computer Contest
- 1997 Fourth Place, Intel Grand Award in Computer Science, International Science and Engineering Fair
- 1997 Fourth place nationally, USA Computer Olympiad Fall Championship
- 1997 First place, American Computer Science League (ACSL)
- 1997 Top scoring U.S. sophomore, American Computer Science League (ACSL)
- 1997 Ross Young Scholar, Ohio State University
- 1997 AT&T Student Software Award, Long Island Software Awards
- 1997 Certificate of Achievement, Mathematical Contest in Modeling
- 1997 Certificate of Merit, The Assembly of the State of New York
- 1997 Certificate of Distinction, American High School Mathematics Examination
- 1997 Summa Cum Laude, National Latin Exam
- 1996-1998 Columbia University Science Honors Program
- 1996 Brandeis Summer Odyssey Young Scholar
- 1996 Perfect Score, National Latin Exam
- 1995-1996 Creative Problem-Solving Institute for Gifted and Talented Students
- 1995 Summa Cum Laude, National Latin Exam
- 1995 First Place, Pascal, Continental Math League Computer Contest
- 1994-1995 John Hopkins Center for Talented Youth (CTY)
- 1994 State and Regional Award, Mathematics and Verbal Talent Search
- 1992-1993 Performed with the New York City Opera Children's Chorus

Publications (Total citations: 69; H-index: 6)

- 14. A. D. Wissner-Gross, C. E. Freer, "Planetary-scale computing architectures for electronic trading," Handbook of Electronic Trading (In press, 2012).
- 13. A. D. Wissner-Gross, C. E. Freer, "Relativistic statistical arbitrage," Phys. Rev. E 82, 056104 (2010).
- 12. A. D. Wissner-Gross, "Dielectrophoretic architectures," Bio-Inspired and Nanoscale Integrated Computing, 155-173 (ed. M. Eshaghian-Wilner, Wiley, 2009).
- 11. A. D. Wissner-Gross, "Intruder dynamics on vibrofluidized granular surfaces," Mater. Res. Soc. Symp. Proc. 1152E, TT03-01 (2009).
- 10. A. D. Wissner-Gross, "Pattern formation without favored local interactions," J. Cell.

- Auto. 4, 27-36 (2008).
9. A. D. Wissner-Gross, T. M. Sullivan, "Multicolor symbology for remotely scannable 2D barcodes," *Proc. SPIE* 6623, 662304 (2008).
 8. L. Cong, A. D. Wissner-Gross, "Interrogating single molecules," *Rec. Pat. Nanotech.* 2, 19-24 (2008).
 7. A. D. Wissner-Gross, "Physically programmable surfaces," Ph.D. Thesis, Department of Physics, Harvard University (2007).
 6. A. D. Wissner-Gross, E. Kaxiras, "Diamond stabilization of ice multilayers at human body temperature," *Phys. Rev. E Rapid Comm.* 76, 020501 (2007).
 5. A. Hatzor-de Picciotto, A. D. Wissner-Gross, G. Lavalley, P. S. Weiss, "Arrays of Cu(2+)-complexed organic clusters grown on gold nano dots," *J. Exp. Nanosci.* 2, 3-11 (2007).
 4. A. D. Wissner-Gross, T. M. Sullivan, "From codex to poster," *Libr. J.* 132, S12-S13 (2007).
 3. A. D. Wissner-Gross, "Dielectrophoretic reconfiguration of nanowire interconnects," *Nanotechnology* 17, 4986-4990 (2006).
 2. A. D. Wissner-Gross, "Preparation of topical reading lists from the link structure of Wikipedia," *Proc. IEEE ICALT* 6, 825-829 (2006).
 1. E. Wissner-Gross, A. D. Wissner-Gross, "People with disabilities," *Journalism Across Cultures*, 203-220 (ed. F. Cropp, Iowa State Press, 2003).

Patents (Total citations: 5; H-index: 1)

15. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "Systems and methods for providing an altered shopping experience in retail environments," U.S. Provisional Patent Application 61/569,119 (2011).
14. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "Systems and methods for providing recreation and social activities in retail environments," U.S. Provisional Patent Application 61/569,115 (2011).
13. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "In-store guidance systems and methods," U.S. Provisional Patent Application 61/569,111 (2011).
12. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "User interface for accessing information about a retail store," U.S. Provisional Patent Application 61/569,110 (2011).
11. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "Smart device location in retail environments," U.S. Provisional Patent Application 61/569,109 (2011).
10. A. D. Wissner-Gross, T. M. Sullivan, R. J. Wolf, R. V. Brazell, "Systems and methods for providing a proximity triggered response in a video display," U.S. Provisional Patent Application 61/569,105 (2011).
9. A. D. Wissner-Gross, T. M. Sullivan, "Method and apparatus for human-powered mobile visual search and feedback," U.S. Patent 8,073,864 (2011).
8. C. E. Freer, A. D. Wissner-Gross, "System and method for relativistic statistical securities trading," U.S. Patent Application 13/117,571 (2011).

7. A. D. Wissner-Gross, T. M. Sullivan, "System and method for electronically certifying relationships," U.S. Provisional Patent Application 61/361,144 (2010).
6. A. D. Wissner-Gross, "Method for creating a topical reading list," U.S. Patent 7,739,294 (2010).
5. A. D. Wissner-Gross, T. M. Sullivan, "Environmental footprint monitor for computer networks," U.S. Patent Application 12/747,825 (2008).
4. A. D. Wissner-Gross, E. Kaxiras, "Diamond stabilization of ice multilayers at human body temperature," U.S. Provisional Patent Application 61/053,737 (2008).
3. A. D. Wissner-Gross, T. M. Sullivan, "Multicolor symbology for remotely scannable codes," U.S. Provisional Patent Application 60/918,736 (2007).
2. A. D. Wissner-Gross, "Method of robotic manipulation utilizing patterned granular motion," U.S. Patent 6,335,059 (2002).
1. A. D. Wissner-Gross, "Robotic manipulation system utilizing patterned granular motion," U.S. Patent 6,216,631 (2001).

Editorial Advisory Boards

2007-Present Recent Patents on Nanotechnology

Refereeing

2011-Present UK Government Office for Science Foresight

2011-Present Recent Patents on Space Technology

2010-Present IEEE Sensors Journal

2010-Present Computer Graphics International Conference

2009-Present Software: Practice and Experience

2008-Present Journal of Electronic Materials

2008-Present Applied Physics Letters

2008-Present Recent Patents on Nanotechnology

2005-Present Nano Letters

Service

2011-Present Invited Member, The Seasteading Institute's Magellan Network

2010-Present Fellowship Interviewer, Fannie and John Hertz Foundation

2009-Present Invited Member, International Telecommunication Union (ITU) Dynamic Coalition on Internet and Climate Change (DCICC)

2007-2008 Code Contributor, One Laptop Per Child

Invited Presentations

1/2012 Global Education and Career Development Center, MIT, Cambridge, MA

12/2011 Philosophical Society of Washington, Cosmos Club, Washington, DC

10/2011 TradeTech Architecture Conference (Keynote), New York, NY

10/2011 The Singularity Summit, 92nd St. Y, New York, NY

9/2011 Future of Science Workshop, Institute for the Future, Palo Alto, CA
 9/2011 Institute for Applied Computational Science, Harvard University, Cambridge, MA
 8/2011 Science Foo Camp, Google, Mountain View, CA
 5/2011 North American Financial Information Summit, New York, NY
 3/2011 American Physical Society March Meeting, Dallas, TX
 3/2011 TradeTech Equity Trading Conference (Keynote), New York, NY
 1/2011 Tagged Inc., San Francisco, CA
 1/2011 Global Education and Career Development Center, MIT, Cambridge, MA
 8/2010 Science Foo Camp, Google, Mountain View, CA
 4/2010 Center for the Environment, Harvard University, Cambridge, MA
 4/2010 Fortune Brainstorm Green 2010, Online
 8/2009 National Science Foundation, Arlington, VA
 5/2009 Yale Club of Boston, Cambridge, MA
 3/2009 Green:Net 2009, San Francisco, CA
 3/2009 Hertz Foundation Symposium, Santa Clara, CA
 2/2009 The Indus Entrepreneurs Boston: Software & Services Group, Waltham, MA
 2/2009 Systems Research at Harvard Seminar, Harvard University, Cambridge, MA
 10/2008 SustainCommWorld, Boston, MA
 6/2008 Virtual Energy Forum 2008, Online
 4/2008 Eastern Regional Retreat of the Fellows of the Hertz Foundation, Woods Hole, MA
 4/2008 Environmental Studies Program, Wellesley College, Wellesley, MA
 4/2007 Materials Research Society Spring Meeting, San Francisco, CA
 4/2007 Condensed Matter Theory Kids Seminar, Department of Physics, Harvard University, Cambridge, MA
 3/2007 Hertz Foundation Symposium, San Jose, CA
 3/2007 One Laptop Per Child, Cambridge, MA
 12/2006 Computer Science Program, Harvard University, Cambridge, MA
 12/2005 Schlumberger-Doll Research Center, Cambridge, MA
 3/2005 Fannie and John Hertz Foundation National Symposium, San Jose, CA
 7/2003 DARPA Moletronics PI Review, Fairfax, VA
 4/2003 Department of Physics, MIT, Cambridge, MA
 10/2002 Society of Physics Students Colloquium, MIT, Cambridge, MA
 3/2002 Intel Student Research Symposium, Santa Clara, CA
 8/2001 NSF NNUN REU Symposium, Howard University, Washington, DC
 10/1999 National Gallery for America's Young Inventors, Akron, OH
 8/1999 MITRE Corporation, Reston, VA
 6/1999 NASA-NCI Workshop on Sensors for Bio-Molecular Signatures, Pasadena, CA
 3/1999 Intel Science Talent Search Symposium, National Academy of Sciences, Washington, DC
 8/1998 MITRE Corporation, Reston, VA
 4/1998 National Science Teachers Association Convention, Las Vegas, NV
 8/1996 Brandeis University, Waltham, MA