

Richard Taylor Curriculum Vitae (January 2019)

1. SUMMARY

Research	311 publications (including 12 in <i>Nature</i> , 4 in <i>Science</i>): 67% in the physical sciences, 20% in art, 10% in psychology and 3% in education. Citations ~ 5200, h index~36 Funding: US\$10.7M (individual/small team grants), US\$75.3M (large team grants)
Primary Projects	Fractal electronic circuits for artificial retinas and novel solar cells Fractal patterns in neuroscience, psychology, vision science and visual art
Teaching	9925 students taught in 4 countries (average student rating of 4.6 on a 0-5 scale) Favorite student review: "If Led Zeppelin and Newton had a baby, that would be Dr. Taylor. He needs a shrine at UO. He made physics fun and interesting" (2017)
Awards	37 awards for research and teaching spanning the arts and sciences, including an InnoCentive Prize, Cottrell Scholarship, Pollock-Krasner Residency, Nobel Foundation Travel Award and a British Royal Society Award
Websites	UO site for documentary and publication downloads: http://blogs.uoregon.edu/richardtaylor Google Scholar: https://scholar.google.com/citations?user=dreqmHgAAAAJ&hl=en&oi=ao 260,000 visits to on-line documentaries featuring my research

Education/Qualifications

2004	Doctor of Science (DSc) in Physics and Astronomy, University of Nottingham, UK
2004	Chartered Scientist (CSci), Science Council, UK
1998-1999	MA, Honors in Art Theory (First Class), Univ. New South Wales (UNSW), Australia
1994-1995	Certificate of Art and Design (CAD) (Distinction), Manchester School of Art, UK
1989	Chartered Physicist (CPhys), Institute of Physics, UK
1985-1988	PhD in Physics, University of Nottingham, UK
1982-1985	BSc, Honors in Physics (First Class), University of Nottingham, UK

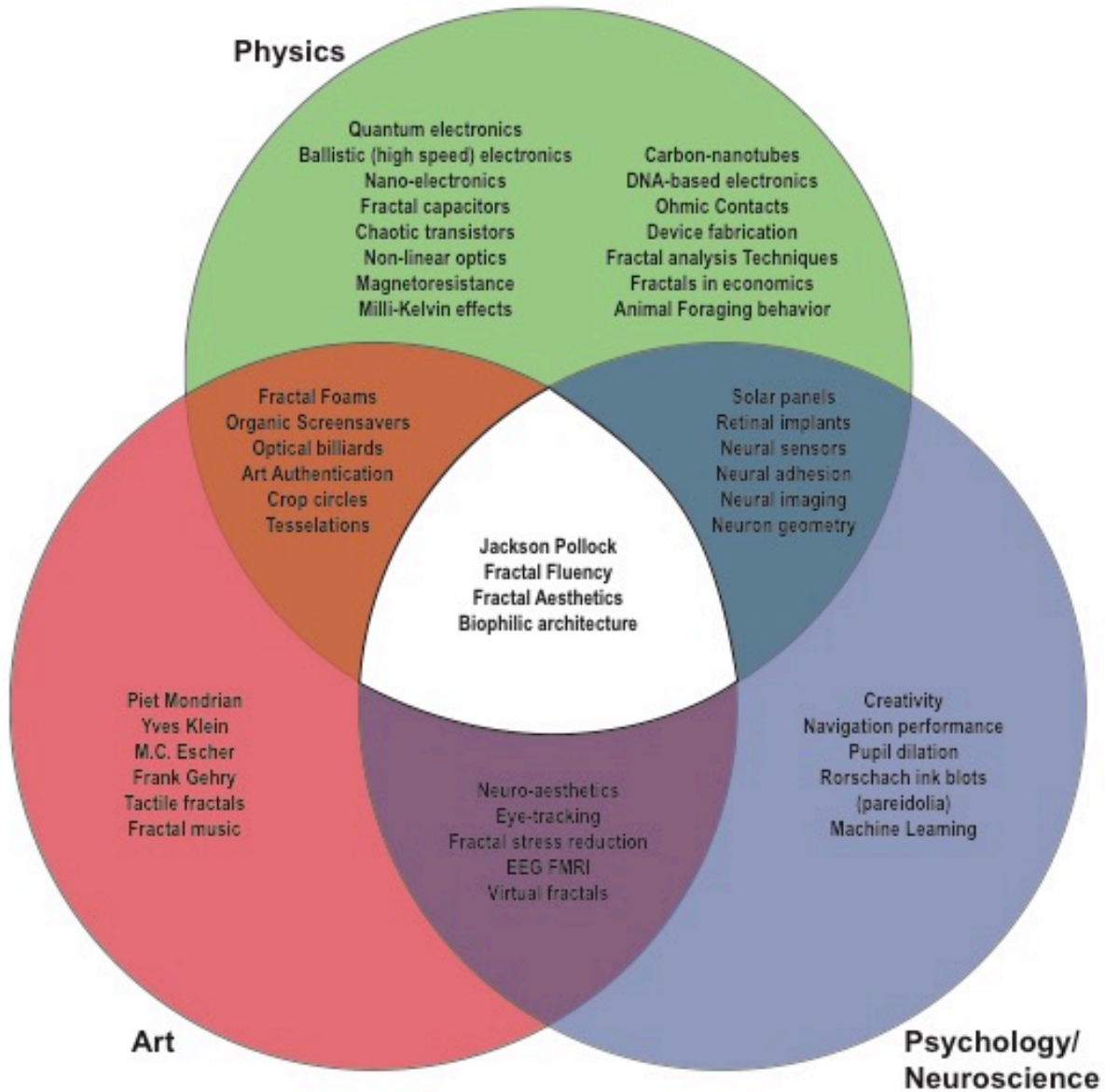
Appointments/Positions

2018-present	Head of the Physics Department, University of Oregon (UO), USA
2010-2018	Director, Materials Science Institute, UO, USA
2009-present	Professor (Physics), Courtesy Professor (Psychology, Art), UO, USA
2005-present	Director, Fractals Research LLC, Eugene, USA
2000-1, 11-12, 16-19	Visiting Professor, University of New South Wales (UNSW), Australia
2013-2014	Pufendorf Fellow, University of Lund, Sweden
2011	Lorentz Centre Fellow, University of Leiden, the Netherlands
2006-2008	Professor, Department of Physics and Astronomy, University of Canterbury (UC), Christchurch, New Zealand (NZ)
1999-2006	Associate Professor, Physics Department, UO, USA
1999-2000	Head of the Condensed Matter Physics Department, UNSW, Australia
1995-2000	Queen Elizabeth II Research Fellow, Australian Research Council, Australia
1993-1994	Research Associate, National Pulsed Magnet Laboratory, Sydney, Australia
1993	Frontier Researcher, RIKEN, Tokyo, Japan
1990-1992	Research Associate, National Research Council, Ottawa, Canada
1988-1990	Research Fellow, Science and Engineering Research Council Glasgow University and Nottingham University, UK
1985-1988	Teaching Fellow, Nottingham University, UK

2. CAREER EXPERIENCE AND ACHIEVEMENTS

2.1 Research

My research addresses fundamental questions about fractals (which are patterns that repeat at increasingly fine size-scales) and the chaotic processes that create them. My main projects focus on applying the concept of bio-inspiration to nanoscience, visual science and visual art and feature an interplay between fundamental and applied research. The diverse applications of my work range from sight-restoration using retinal implants to stress-reduction using art. Details can be found on my website: <http://blogs.uoregon.edu/richardtaylor>



2.2 Leadership and Management

- **Institute Directorships.** I was Director of the *Materials Science Institute* (MSI) from 2010-18. This position oversaw 35 academic faculty, 3-4 administrative staff and 130 graduate students. With a typical operating budget of \$19M, the average annual grant income during my directorship was \$10M. In addition to its research activities, the MSI runs highly active educational, public outreach and diversity programs. Given that UO directorships typically span 3 years, my 8 years in this elected position reflects my colleagues' confidence in my ability to lead one of the UO's largest institutes. In 2008, I was invited to be Director of

the *MacDiarmid Institute*, New Zealand's premier national research institute consisting of 41 faculty from 4 universities (I declined this opportunity to return to the UO).

- **Departmental Leadership.** In July 2018, I became Head of the UO Physics Department. Featuring 41 faculty members, it is one of the largest UO departments and is rated by the US National Research Council to be in the top 20% of R1 public universities. I was also elected Chair of the UO Physics Department's Personnel Committee for 2009-10, 2013-14 and 2015-17. This corresponds to being selected for two thirds of the years that I was eligible. This central committee handles critical personnel issues, such as annual evaluations, tenure processes, promotions, personnel disputes, etc. At UNSW, I was Department Head of the Condensed Matter Physics Department, overseeing 9 academic faculty members, from 1999-2000.
- **Large Team Management.** I have demonstrated leadership skills in all stages of research programs. This includes establishing laboratories and assembling large research teams based in Australia, Canada, New Zealand, the UK and the USA. These projects utilized my ability to create research networks that pool the resources and expertise of my laboratories with those of international leaders from 10 countries. As a current example, my \$2M bionic eye project integrates 12 UO researchers with collaborators in Australia, New Zealand and Sweden.
- **Grant Management.** I have managed research, outreach and educational programs funded by agencies from 8 countries: the *Australian Research Council (ARC)* (Australia), *Department of Education, Employment, Training and Youth Affairs* (Australia), *Department of Industry, Science and Technology* (Australia), *Von Braun Foundation* (Austria), *National Research Council (NRC)* (Canada), *Frontier Research Program* (Japan), *Japanese Science and Technology Agency* (Japan), *Royal Society of New Zealand* (New Zealand), *Health Research Council* (New Zealand), *Crafoord Foundation* (Sweden), *Pufendorf Institute* (Sweden), *Swedish Research Council* (Sweden), *Addario Foundation* (USA), *Air Force Office of Scientific Research* (USA), *Burroughs Wellcome Fund* (USA), *Gordon and Betty Moore Foundation* (USA), *Kavli Foundation* (USA), *WM Keck Foundation* (USA), *Murdock Trust* (USA), *National Science Foundation (NSF)* (USA), *Office of Naval Research (ONR)* (USA), *Oregon Nanoscience and Microtechnologies Institute (ONAMI)* (USA), *Pollock-Krasner Foundation* (USA), *Providence Health* (USA), *Research Corporation for Science Advancement (RCSA)* (USA), *Templeton Foundation* (USA), *British Royal Society* (UK), *Engineering and Physical Sciences Research Council (EPSRC)* (UK) and the *Science and Engineering Research Council (SERC)* (UK).

2.3 Awards, Fellowships, Scholarships, Society Memberships and Other Honors

- **Research Awards:** The *UO Faculty Excellence Award* (USA 2016), *UO Innovation and Impact Award* (USA 2016), *WM Keck Medical Research Award* (USA 2016), *InnoCentive Prize* (USA, 1 awarded from over 950 applicants in 2014), *Pufendorf Fellowship* (Sweden 2014), *Lorentz Center Visiting Fellowship* (Netherlands 2011), *RCSA Scialog Solar Energy Fellowship* (USA 2011), *Pollock-Krasner Study Center Residency* (USA 2005), *RCSA Cottrell Scholarship* (USA, 12 awarded from 122 applicants in 2003), the prestigious *Queen Elizabeth II Fellowship* (Australia, 10 awarded from 268 applicants in 1995), *RIKEN Frontier Researcher* (Japan 1994) and a *SERC Fellowship* (UK, awarded to young researchers displaying "exceptional promise for leading research," 10% success rate for applications in 1988).
- **Teaching Awards:** *Champion Professor* (UO students' top 25 professors) (USA 2011), the *UO Williams Fellowship* for innovative teaching (USA 2010), *UO Thomas Herman Distinguished Teaching Award* (2010) (USA, a highly competitive award with only 2 awarded annually from over 1000 instructors), *Murdock Trust Partners in Science Award* (USA 2007) and the *Outstanding Teacher in Higher Education Award* from the *Oregon Academy of Sciences* (USA 2005). The *RCSA* showcased my *Cottrell Scholarship* in 2007 and 2011 as an example of how to successfully integrate teaching and research activities.
- **Travel Awards:** From *Australian Research Council* (Australia 2019, 2018, 2015), *Vivid Sydney* (Australia 2016), *Australian Research Council* (Australia 2015), *Kavli Foundation* (USA 2014), *EPSRC Global Engagement Visitor* (UK 2013), *UNSW Visiting Fellowship* (Australia 2012), *RCSA* (USA 2011),

Pompidou Centre (France 2009), *Von Braun Foundation* (Austria 2008), *Technet Australia* (Australia 2007), *MacDiarmid Institute* (New Zealand 2007), *Arnold Schoenberg Center* (Austria 2005), *Forum21* (France 2005), *American Institute of Architects* (USA 2005), *Guggenheim Foundation* (Italy 2004), *Royal Swedish Academy* (Sweden 2003), *Sigma Xi Research Society* (USA 2001), *Advanced Telecommunications Research Institute of Japan* (Japan 2001), *Nobel Foundation* (Sweden 2000), *British Royal Society* (UK 1994), *Japanese Frontier Research Program* (Japan 1993), *NATO* (UK 1989) and a *Kilby Scholarship* (UK 1987).

- **Writing Awards.** I was a finalist in the prestigious *Northwest Perspectives Essay Contest* in 2010 and was nominated by the editors of *Scientific American* for the *American Institute of Physics Science Writing Award* in 2003.
- **Society Memberships:** *American Physical Society* USA, *National Academy of Inventors* USA, *Sigma Xi Research Society* USA (honorary membership in recognition of “outstanding interdisciplinary research”), *Society for Chaos Theory in Psychology and the Life Sciences* USA, *Institute of Physics* UK, *Science Council* UK.
- **Other Honors:** Invited twice to the White House to discuss my research (2014), *National Silver Medal Award* from the *US National Council for Advancement and Support of Education* (2006), an A rating from New Zealand’s 5-year national assessment scheme (the *Performance Based Research Fund*, 2006), and a Doctor of Science (Nottingham University, 2004) for recognition of outstanding contributions to science (D.Sc. requirements include more than 100 publications in peer-reviewed journals and peer recognition as a leading, international scientist sustained over a 15-year period).

2.4 Teaching/Education

- **Lecturing Experience.** I have gained a wide experience of different approaches to university-level physics education by teaching in Australia, New Zealand, the UK and the USA. I have taught a broad spectrum of undergraduate and graduate courses. My current passion focuses on teaching interdisciplinary classes of up to 500 students (100 and 200 level) which require sophisticated approaches to pedagogy. I participate in various UO programs which keep me informed of novel ideas (e.g. The Herman Teaching Awards Committee, Science Literacy Program, Teaching Academy and Williams Council).
- **Courtesy Professorships.** For my UO Psychology Professorship, teaching responsibilities included co-chairing the *Complexity and Nonlinear Dynamics Focus Group* (which featured a seminar series for undergraduates and graduates from computer science, human physiology, physics, psychology and the Teaching Effectiveness Program) and advising graduate students. For my UO Art Professorship, I gave lectures at an international sketch class (Italy 2004) organized by the UO Art Department and contributed to the associated art exhibitions (2005). In addition, my *RCSA Cottrell Scholarship* was focused on communicating science to art students.
- **Curriculum Development.** As MSI Director, my focus was on graduate program development. I worked closely with the UO *Graduate Internship Program* in which 60 MSI Masters students gained real world knowledge working in industrial laboratories and companies. The MSI also developed a *Professors of Practice* program to appoint visiting professors from industrial/national laboratories to teach UO courses on their research topics. The MSI recently launched UO’s first *Lens of the Market* program for students and faculty wanting to learn the skills of research commercialization. I helped to develop the UO educational PhD program *Interdisciplinary Materials Program to Accelerate the Transition from Student to Scientist* and served on the committee that administered the associated US\$2.8M NSF grant (2001-5 and 2008-9). The MSI also hosts one of the longest running *NSF Research for Undergraduates* programs in the country. When I served on the Physics Department Curriculum Committee, I participated in the development of diverse lower division undergraduate courses such as *Light, Color, and Vision*.
- **Mentoring Research Students.** I am head of the UO *Fractals Research Laboratory* which typically features 2-3 undergraduate and 4-5 graduate researchers. Research supervision (1995-2019) includes: 4 post-

doctoral associates, 1 research associate, 19 PhD students, 23 Masters students and 35 undergraduate students. This includes students majoring in biology, chemistry, computer science, human physiology, mathematics, philosophy, physics and psychology. I have served on 61 PhD committees from architecture, chemistry, human physiology, psychology, sociology and physics.

- **Mentoring Teaching Fellows.** I have mentored 147 UO graduate teaching fellows (2001-2018), most of whom were trained to teach tutorials featuring 30 General Physics students. During 2003-6, I also participated in the *NSF educational program Oregon Partnership to Enhance Science, Technology, Engineering and Mathematics Education* in which graduate teaching fellows taught at rural Oregon high schools.
- **Other Mentoring.** I have participated in the *UO Summer Academy to Inspire Learning* (a summer camp for middle and high school students from low-income or underrepresented backgrounds) (2008, 2012-18), the *UO Science and Invention Fair* for K-8 students (2016-18), the *NSF Research for Undergraduates* program (2013-17), UO Honors College thesis advising, *UO Technology Entrepreneurship Program* (teaching graduate students research commercialization skills) (2012) and the *UO Catalytic Outreach and Research Experience* (a 10 week summer program designed to expose community college students to world-class research experiences) (2010). My *Murdock Trust Partners in Science* award focused on mentoring high school teachers (one teacher was awarded a *NSF Einstein Award* for the research conducted in my laboratory) (2007-9). I have also mentored local artists in art-science projects (2012-17) and public speakers (e.g. holding on-line question-answer sessions for the *Nanoscale Informal Science Education Network* (2010), and lectured to artists (*Manchester School of Art* 1994-95).
- **Reviewing Teaching Tools.** I review undergraduate textbooks: *Physics* by Cutnell (Wiley 2011, 2016), *College Physics* by Knight, Jones and Field (Pearson 2015), *College Physics* by Giordano (Cengage Learning 2013), *General Physics* by Freedman et al (Freeman 2010, 2012), *General Physics* by Giancoli (Pearson 2004, 2009) and *Viewpoints: Lessons in Mathematics and Art* by Franz (Princeton University Press 2005). I also review educational DVDs (*The Teaching Company* 2007-8), science education magazines (*Science News* 2007) and educational TV programs (*NOVA's ScienceNow* and *Digital Art Forgery*).
- **Impact of my Research on Education.** My research has been the subject of lectures at other universities, demonstrating the impact of my research on education. This includes the following courses: *Aesthetic Computing* (University of Florida, USA), *Art and Physics* (Physics Department, Hong Kong University), *Complexity* (Philosophy Department, Xavier University, USA), *Computational Physics* (Physics Department, Oregon State University, USA), *From Hamiltonians to Chaos* (School of Physics and Astronomy, Nottingham University, UK), *Math in The Art Curriculum* (Mathematics Department, Connecticut College, USA), *Methods in Written Communication* (English Department, University of Alaska, USA) and *Science and Art* (Art History and Physics Departments at Boston College, USA). My research also appears in educational DVDs: *Chaos Theory* (by S. Strogatz, Cornell University) and *The Quantification of Style* (by D. Rockmore, Dartmouth College).

2.5 Publications and Writing

- **Publications:** Listed in Section 3, publications include books, book chapters, refereed articles and invited publications (review articles and commissioned contributions for journals/magazines such as *Nature*, *New Scientist*, *Physics Today*, *Physics World*, *Science*, *Scientific American* and *Smithsonian*). Journal editors regularly invite me to write opinion pieces on books and exhibitions (e.g. in *Nature*, *Science*, *The Physicist* and *Physics World*) and publishers invite me to write reviews for popular science books. My 10 most cited papers reflect my inter-disciplinary interests: 4 are in physics, 4 in art, and 2 in psychology.
- **Impact:** Reflecting my status within the Fractals research community, I was asked to write the memorial eulogy of Benoit Mandelbrot (founder of the field of Fractals), his obituary in *Physics Today* (2011) and his *Proctor Prize* announcement (2002). Reflecting my status within the Chaos research community, I was

asked to write a chapter of the book celebrating the life of Edward Lorenz (founder of the field of Chaos) (2008). Reflecting the impact of my art-science projects, I was commissioned by *Science* to write a career essay (2001).

- **Undergraduate Textbooks.** I authored the *General Physics Study Guide* (Pearson 2013, 2014, 2016, 2017 editions) and *Light, Color and Vision* (Pearson, 2011, 2012, 2014 editions). I edited a custom edition of *Physics: Principles and Applications* (Pearson, 2010). I have been asked to co-write *College Physics* for Pearson. Their top editorial representative (Jim Smith) noted my communication skills impressed him “more than any potential author in the past 18 years of working with the company.”

2.6 Talks, Outreach and Media Coverage

- **Academic Talks.** Invitations include conference banquet speeches and plenary talks, and come from diverse fields (architecture, art, electrical engineering, linguistics, mathematics, non-linear science, physiology, psychology and physics) and countries (Australia, Austria, Belgium, Brazil, Canada, China, Egypt, France, Germany, Holland, Iran, Italy, Japan, Mexico, New Zealand, Norway, Portugal, Spain, Sweden, Thailand, Turkey, the UK and the USA). The subjects of my talks have included: abstract art, the art-science divide, bionic eyes, Chaos, crop circles, Fractals, human vision, industrial physics, interdisciplinary collaboration, Jackson Pollock, Leonardo Da Vinci, Mauk Escher, Modern physics, nanotechnology, Nikola Tesla, quantum physics, retinal implants, the science of athletics and the science of creativity.
- **Conference Discussion Panels.** I have been invited to serve on panels with themes ranging from Einstein to Modern Art. These include: *Improving Vision for All* (Sweden 2014), *Capacity Building for Industrial Physics in Emerging and Developing Economies* (Italy 2012), *Oxford Round Table* (UK 2010), *Oregon Nanoscience and Microelectronics Institute Symposium* (USA 2006), *Forum21* (France 2005), *Science and Literature International Conference* (France 2004), *Sigma Xi and Phi Beta Kappa Intersections in Science and Humanities Research* (USA 2001) and the *International Conference on the Interdisciplinary Study of Symmetry* (Australia 2001).
- **Public Lectures.** I have been invited to give many public lectures around the world. These lectures communicate art and science to broad audiences, attracting up to 650 people per lecture. For example, I hold the attendance record for the *Oregon Museum of Science and Industry Science Pub Talks* (350 people). Other examples include: *TEDx Talks* (USA 2014 and 2018), the *Museum of Contemporary Art Sydney* (Australia 2016), *Museum of Sketches* (Sweden 2014), *Portland Institute of Contemporary Art* (USA 2013), *SunRiver Nature Center* (USA 2012), *PICNIC* (Amsterdam 2011), *Tehran Museum of Contemporary Art* (Iran 2011), *Oregon Museum of Science and Industry* (USA 2010), *Pompidou Centre* (France 2009), *Australian Technet* (Australia 2007), *New Zealand Royal Society* (New Zealand 2007), *Schoenberg Center* (Austria 2005), *Guggenheim Museum* (Italy 2004), *Phi Beta Kappa and Sigma Xi Research Societies* (USA 2001), *Pollock-Krasner Center* (USA 2001), *Australian National Art Gallery* (Australia 1999, 2001) and the *Australian Museum* (Australia 1998).
- **Outreach.** I am part of the UO’s monthly *Run with a Researcher* program (2016-present). I belong to the *Tate Gallery’s Bigger Picture* project, in which experts present novel interpretations of art (UK 2003-present). I have written information panels to accompany exhibits at the *Tate Modern Gallery* (UK) and the *Portland Art Museum* (USA). My art, sculptures and photography feature in exhibitions to promote art-science endeavors to wider audiences. These include: *The National Museum of Mathematics* (USA 2015), *Scientific American’s The Unreasonable Beauty of Mathematics* exhibition (USA 2011), *Oregon Museum of Science and Industry* (USA 2010), *Portland Art Museum* (seen by 60,000 visitors in 2009), the *UO Knight Library’s Art of Science* (USA 2009), *Sacred Heart Hospital* (USA 2004), the *Manchester School of Art* (UK 1995), the *Royal Northern College of Music* (UK 1994) and the *Whitworth Art Gallery* (UK 1994). In 2017-18, I was on the Art Committee for the UO Knight campus, in charge of developing a \$1M art project. In 2013, I was a visiting artist at the *Portland Institute of Contemporary Art* exploring art-science projects. In 2012, I initiated the Artist in Residence Program for the UO *Lewis Integrative Science Building* designed to help artists describe science to the public.

- **Radio and Television Coverage.** I regularly give interviews on radio and TV programs in Australia, New Zealand, the UK and the USA (60 in the past 30 years). I participate in the UO *Experts Program* in which selected academics answer media inquiries. I featured in the *NHK Japan* documentary *Pollock* (2012), the BBC TV program *The Code* (2011) and the *PBS NOVA* episode *Hunting the Hidden Dimension* (2008). I was the subject of a 30-minute national TV program (the *Art of Science*, Australian Broadcasting Company, 1998) and played a central role in the theme development and in writing the narration. These documentaries can be downloaded from my UO website.
- **Coverage by Journalists.** My work has been the subject of hundreds of articles in journals/magazines (e.g. *Art News*, *The Atlantic*, *Discover*, *Nature*, *New Yorker*, *New Scientist*, *Physics World*, *Physics Today*, *Popular Mechanics*, *Popular Science*, *Science*, *Science News*, *Scientific American*, *Smithsonian*, and *Time*) and in prominent newspapers in Australia (*The Canberra Times*, *Sydney Morning Herald*), Canada (*National Post*), France (*Liberation*), India (*The Hindu*, *Times of India*), Italy (*Catholic On-line*), Sweden (*Svenska Dagbladet*), the USA (e.g. *The Boston Globe*, *Chicago Sun Times*, *Chicago Tribune*, *Houston Chronicle*, *Idaho Statesman*, *International Business Times*, *Los Angeles Times*, *New York Times*, *Oregonian*, *San Diego Tribune*, *Wall Street Journal*, *USA Today*, *Vanity Fair*, *Washington Post* and *Google News*) and the UK (e.g. *The Daily Mail*, *Daily Telegraph*, *Guardian*, *Independent* and *The Times*).
- **Coverage by Authors.** My work features in popular-style art and science books (e.g. *The Artful Universe* by J. Barrow, *Colliding Worlds* by A. Miller, *The Complete Idiot's Guide to String Theory* by G. Musser, *Fractals, Graphics and Mathematics Education* by M. Frame et al, *In the Pursuit of Elegance* by M. May, *Introducing Fractal Geometry* by N. Lesmoir-Gordon et al, *Jackson Pollock: Veiling the Image* by D. Wigal, *The Nature Fix* by F. Williams, *Quantum Technology* by G. Milburn, *Simplexity* by J. Kluger, *The Shape of Green: Aesthetics, Ecology and Design* by L. Hosey, *The Story of Measurement* by A. Robinson and *Winged Gifts of Grace* by L. Compton), key research books (e.g. *Encyclopedia of Non-linear Science* by A. Scott, *Introduction to Quantum Chaos* by K. Nakamura et al, *Network Visualization* by M. Lima, *Quantum Chaos and Quantum Dots* by K. Nakamura et al and *Transport in Nanostructures* by D. Ferry et al) and an undergraduate text book (*Calculus* by R. Larson et al).

2.7 Professional Activities

- **University of Oregon Service:** CAS Task Force (2018-19), Physics Cross-Campus Curriculum Committee (2018-19), Moore Inventor Review Committee (2017-18), Physics Post-tenure Review Committee (2017-18), Physics Space Committee (2016-19), Energy and Sustainable Materials Cluster Leadership Team (2014-18), Executive Subcommittee of the Space Advisory Group (2016-18), Teaching Academy (2016-19), Williams Council (2014-18), Acting Department Head (occasional, 2010-18), MSI seminar organizer (2001-02, 2010-18), Physics Personnel Committee (2002-3, 2009-10, 2013-14 and 2015-17), VPRI's Institute Review Committee (2015-16), Herman Distinguished Teaching Awards Committee (2013-15), President's Competitive Excellence Strategic Task Force (2014-15), Applied Science Ad Hoc Exploration Committee (2013-15), College and Careers Brainstorming Group (2015), Biophysics Faculty Search Committee (2013-14), Centers and Institutes Council (2013-14), Coordinating User Group and Materials/Physical Sciences User Group for the *Lewis Integrative Science Building* (2010-12), Physics Colloquium Organizer (2001, 2004, 2012), Humanities Center Advisory Board (2008-11), Physics Curriculum Committee (2009-10), Biophysics Faculty Search Committee (Chair, 2010), Intercollegiate Athletics Committee (2008-10), Physics PhD Exam Committee (Chair, 2004-6), Physics Graduate Recruitment Committee (2001-5) and the Physics Graduate Admissions and Awards Committee (2002). **University of Canterbury Service:** University Research Advisory Group (appointed by the Pro-Vice Chancellor, 2007-8), Teaching Curriculum Committee (2006-8), 200-level Course Coordinator (2006-8) and the Rhodes and Woolf Fisher Scholarship Interview Panel (2007). **UNSW Service:** Department Head, Condensed Matter Physics Department (1999-2000).
- **Promoting Diversity:** I enthusiastically promote diversity both in my personal life and in my professional capacity of teacher, researcher and leader. As MSI director, I helped to develop, fund or participate in the

following programs designed to enhance recruitment and participation of under-represented or low-income student groups: *Community for Minorities in STEM*, *Mad Duck Science*, *North Star*, *Pacific Northwest's Chapter of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers*, *Pacific Northwest Conference for Undergraduate Women in Physics*, *Scholarships for Oregon Scientists II Program*, *Society for the Advancement of Chicanos/Hispanics and Native Americans in Science*, *UO Catalytic Outreach and Research Experience*, *UO Summer Academy to Inspire Learning*, *UO Summer Science Camp*, *UO Summer Program for Undergraduate Research*, *UO's Women in Graduate Sciences Group*. As Chair of the Physics Personnel Committee, I introduced new rules for the composition of faculty search committees to encourage a higher diversity of candidates interviewed. In the searches I have participated in, one third of the recruited faculty came from under-represented groups (a high number for my field). As a PhD advisor, one third of my students have been women and one fifth have been foreign (again, high ratios for physics). As a lecturer, my empathy towards students with atypical backgrounds and circumstances is well known. This not only impacts formal pedagogy (e.g. my *General Physics* course incorporates 16 weekly tutorial sessions in which student teams collaborate to help each other) but extends to more simple gestures such as allowing children of mature students to participate in lecture demonstrations. I also help more than 20 students each year through the Accessible Education Center.

- **Journal Editorial Positions:** *Chaos and Complexity Letters* (Editorial Board 2004-2019), *Journal of Non-linear Dynamics*, *Psychology and Life Sciences* (Editorial Board 2004-2019), *Nature* (Reader Advisory Panel 2008-10) and *Pattern Recognition Letters* (Guest Editor 2006).
- **Journal Reviewing:** *Annals of Physics*, *Biology Letters*, *British Journal of Psychology*, *Chemical physics Letters*, *Computational Statistics and Data Analysis*, *Europhysics Letters*, *Frontiers in Cognition*, *Journal of Applied Physics*, *Journal of Applied Surface Science*, *Journal of Chaos*, *Journal of Chaos and Graphics*, *Journal of Cognition and Emotion*, *Journal of Consciousness Studies*, *Journal of Discrete Dynamics in Nature and Society*, *Journal of Mathematical Imaging and Vision*, *Journal of Nanotechnology*, *Journal of Non-linear Dynamics*, *Psychology and Life Sciences*, *Journal of Perception*, *Journal of the Royal Society*, *Journal of Surface Science*, *Journal of Systems Research and Behavioral Science*, *Knowledge Based Systems*, *Leonardo*, *Nature*, *Neuroreports*, *Neuroscience Letters*, *Philosophies*, *Physica A*, *Physica B*, *Physical Review B*, *Physical Review E*, *Physical Review Letters*, *Proceedings of the National Academy of Sciences*, *Science*, *Transactions on Applied Perception* and *Trends in Cognitive Sciences*.
- **Grant Reviewing:** *The ARC* (Australia), *Civilian Research and Development Foundation* (USA), *Fulbright Program* (USA), *Guggenheim Foundation* (USA), *Lokey Science and the Human Condition Fund* (USA), *National Institutes of Health (NIH)* (USA), *NSF* (USA), *ONAMI* (USA), *ONR* (USA), *RCSA* (USA), *Templeton Foundation* (USA) and *The Leverhulme Trust* (UK).
- **Review Panels:** The Nanometrology, Nanoelectronics and NanoBioTechnology Research Initiative Panel (this 4 member panel allocated US\$14.2M funds from the *ONR* and *ONAMI* between 2006-12), Juror for *The Guild of Natural Science Illustrators* (2010-12), *UO Oregon Humanities Center Research Panel* (2008-11), *Royal Society of New Zealand Chemical and Physical Sciences Fellowship Panel* (2006-8), International Expert for the *Australian Academy of Sciences* (2001-5), *NIH Scientific Review Panel for Mind, Body and Health* (2004) and the *Australian Nanotechnology Benchmarking Project* (2003).
- **Reviewing Institutes.** I served on an international 3-member review team of the *Pufendorf Institute*, Sweden (2016). I also conducted the *Oregon Humanities Center's* 10-year review for the UO VPRI's office (2016).
- **Research Consultancy.** As Director of *Fractals Research LLC*, I have advised the *International Foundation for Art Research* (USA) and the *Pollock-Krasner Foundation* (USA). These organizations authenticate art works of major artists and their invitations reflect my status as a leading expert in pattern analysis. I review as many as 40 paintings annually. Other consultancy includes: *Mohawk Group* (2018-19), *Opportunities Development Group* (2014), *Envision Design PLLC* (2005), *Eco-Integrations Inc.* (2001-2003), *Hawaii Center for Learning Science Through Art* (2001), *Prince of Wales Hospital*, Sydney (1999), *Sydney Police*

Force (1999) and scientific advisor for architects of the \$1.2M UNSW *Centre for Quantum Computing* (1994).