

Dr. Jatila van der Veen
Project Scientist I, Department of Physics University of California, Santa Barbara
Adjunct Professor of Astronomy, Santa Barbara City College

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CURRENT EMPLOYMENT:

Project Scientist, Department of Physics University of California, Santa Barbara (since 2009)
NASA-funded Projects Starlight and DE-STAR, Lubin Experimental Cosmology Group
Project manager for UCSB's California SpaceGrant program
Adjunct Professor of Astronomy, Santa Barbara City College (since 2014)

Co-Investigator with P. Lubin on:

California Space Grant 2018-2019
California Space Grant 2017-2018
California Space Grant Workforce Development 2017, 2018
California Space Grant STEM Pipeline Development 2014

Co-Investigator with P. Lubin, pending:

California Space Grant Workforce Development 2019
California Space Grant STEM Pipeline Development 20-19

Previously Principal Investigator on:

1. The Plank Visualization Project: Education and Public Outreach Effort of the U.S. Planck Mission, NASA/JPL contract # 1388406, 2008 – 2016.

Projects developed and directed:

- 1) Interactive Mission Simulation in Virtual Reality, with graduate students John Moreland and Gerald Dekker at Purdue University Calumet Center for Visualization and Simulation;
- 2) Music of the Cosmos – Sonification of the Cosmic Microwave Background, with Professor Philip Lubin (Department of Physics, UCSB), Professor JoAnn Kuchera-Morin (Professor, Media Arts & Technology) and graduate students Basak Alper, Ryan McGee, and Richard Duran;
- 3) Interactive museum display, with undergraduate programmer Blake Regalia;
- 4) Interdisciplinary Physics Course, Symmetry and Aesthetics in Contemporary Physics.

2. Faculty Research Grant, 2014-2015: Astronomy Learning in Immersive Virtual Environments, with Professor Jim Blascovich (Department of Psychology and Brain Sciences).

3. NASA California Space Grant 2013 award # LPSDG5, 2013-2015. Revising and updating interactive museum display in astronomy for the Santa Barbara Museum of Natural History, with undergraduate research assistant Hannah Kang.

Graduate Advisors: Professor Jenny Cook-Gumperz (UCSB, Education), Dissertation Chair; Professor Philip Lubin (UCSB, Physics); Professor Eric Mazur (Harvard, Physics & Physics Education); Dr. Jason Raley (UCSB, Education)

Postdoctoral Advisor: Professor Philip Lubin (UCSB, Physics)

EDUCATION:

Ph.D., 2007, Education, Gevirtz Graduate School of Education, University of California, Santa Barbara 4.0 GPA. Emphasis: Teaching and Learning, Science Education. Dissertation title: *Symmetry and Aesthetics in Introductory Physics: An Experiment in Interdisciplinary Physics and Fine Arts Education*. (UMI No. 3283679) Committee: Professor Jenny Cook-Gumperz (chair, Sociolinguistics); Professor Philip Lubin (co-chair, Physics); Professor Jason Raley (Education), Professor Eric Mazur (Harvard University, Physics).

M.A., M. Phil., Geological Sciences, Lamont-Doherty Geological Observatory, Columbia University. Major: Seismology; minors in Physics, Geomagnetism, Stratigraphy.

B.A., Geology, with honors, Barnard College, Columbia University, New York,

RECENT TEACHING EXPERIENCE:

Lecturer, Interdisciplinary Studies Program, College of Creative Studies at UCSB, 2007-2008; 2010 –2016.

Lecturer, UCSB Department of Physics, 2000 – 2004; 2014 – 2016.

Adjunct Professor, Astronomy, Santa Barbara City College, August, 2014 - present

Assistant Professor of Science Education, Purdue University-Calumet, 2008-2009; joint appointment in the School of Engineering, Math, and Science and School of Education. Teaching of undergraduate science for non-majors, basic physics for engineers, teacher education for pre-service science teachers, field supervision of student teachers, and supervision of graduate student researchers

PUBLICATIONS:

van der Veen, J. (2016). Draw Your Physics Homework? Art as a Path to Understanding and Assessment in Undergraduate Science Education. Invited book chapter, *in* The Use of Drawings in Science Education, Phyllis Katz, Ph.D., Ed. Sense Publishers.

van der Veen, J., Cornick, J., Blascovich, J., Spooner, L. (2014). Astronomy Learning in Digital Virtual Environments: Preliminary Study, *in prep.* Poster presented at 2014 ThinkSpatial conference, June 3, 2014 available at <http://spatial.ucsb.edu/2014/spatially-enabled-smart-places/posters>

van der Veen, J., (2013). Symmetry as a thematic approach to physics education, in *Symmetry: Culture and Science* Vol. 24, Nos. 1-4, 463-484, 2013

van der Veen, J., (2013). Student-generated Representations of Special and General Relativity in an Interdisciplinary College Course. Invited paper, AERA Symposium Drawing scientific ideas: Student-generated representations as means of sense-making, communicating ideas, and meta-representational competence, April, 2013.

van der Veen, J., Moreland, J., & McGee, R. (2012). The Planck Visualization Project: Immersive and Interactive Software for Astronomy and Cosmology Education, Conference Proceedings, *International Dynamic, Explorative and Active Learning*, Karadag, Z. &

Devecioglu-Kamakci, Y. Eds., Bayburt, Turkey, July 2-5, 2012, pp. 173-188. ISBN # 978-605-61893-4-0

van der Veen, J. (2012). Draw your physics homework? Art as a path to understanding in Physics Teaching. American Educational Research Journal, April 2012, Vol. 49, No. 2, pp. 356–407. DOI: 10.3102/0002831211435521. originally published online 21 February 2012.

McGee, R., van der Veen, J., Wright, M., Kuchera-Morin, J., Alper, B., and Lubin, P. (2011). Sonifying the Cosmic Microwave Background, in Proceedings of the 17th International Conference on Auditory Display (ICAD-2011) June 20-24, 2011, Budapest, Hungary. ISBN 978-963-8241-72-6

Dekker, G., Moreland, J., and van der Veen, J. (2011). Developing the Planck Mission Simulation as a multi-platform immersive application, Proceedings of the ASME 2011 World Conference on Innovative Virtual Reality, WINVR2011, June 27-29, 2011, Milan, Italy, paper # WINVR2011-5575

van der Veen, J. (2010). The Planck Visualization Project: Seeing and Hearing the Cosmic Microwave Background, in Science Education and Outreach: Forging a Path to the Future ASP Conference Series, Vol. 431, 2010, Eds. Jonathan Barnes, James G. Manning, Michal G. Gibbs, and Denise A. Smith, p. 295-306.

van der Veen, J. (2007). Symmetry and Aesthetics in Introductory Physics: An Experiment in Interdisciplinary Physics and Fine Arts Education, Ph.D. Dissertation, September, 2007.

<http://search.proquest.com.proxy.library.ucsb.edu:2048/docview/621726060/13AF6C111306CBD4DC5/1?accountid=14522>

van der Veen, J., Lubin, P., Natoli, P., and Seiffert, M. (1998). Small Scale Anisotropies: The Final Frontier, invited feature article in *The Physics Teacher*, Vol. 36, no. 9, Dec., 1998 pp. 529-538.

van der Veen, J. and Lubin, P. (1993). Spotlight on the Sun, with P. Lubin in *The Physics Teacher*, v.31, no. 5 May, 1993 p. 309. DOI: [10.1119/1.2343770](https://doi.org/10.1119/1.2343770)

Lubin, P., and van der Veen, J. (1992). The Remote Access Astronomy Project at UCSB: An Example of a University/High School Cooperative Educational Effort, in *Education & Computing: Proceedings Of The International Conference On Informatics In Education*, Elsevier, Inc., [Volume 8, Issues 1–2](#), June 1992, pp. 79–82

Lubin, P., and van der Veen, J. (1992). The UCSB Remote Access Astronomy Project, in *Robotic telescopes in the 1990s*, ed. A. V. Filippenko, ASP Conference Series (ASP: San Francisco), vol. 34, pp. 253-260.

McCann, W.R., Nishenko, S.P., Sykes, L.R., Krause, J. (1979). Seismic gaps and plate tectonics: Seismic potential for major boundaries. *PAGEOPH* (1979) 117: 1082. doi: 10.1007/BF00876211,

SYNERGISTIC ACTIVITIES

Resident choreographer: Summer, 2013, 2014, 2015. Art 2 Science / Science 2 Theater camp for students age 9 – 13 at the University of Notre Dame, South Bend, IN, under the auspices of the Joint Institute for Nuclear Astrophysics. The purpose of the camp is to teach physics concepts through dance, and the physics behind theater productions. My role is to teach principles of physics through dance and to use dance to tell a story. I have produced three choreographies with multi-media productions: Lives of Scientists, The Real Big Bang Theory, and Symmetry and String Theory: The Search for Nature’s Deepest Secrets. See <http://www.jinaweb.org/outreach/artCamp/>

Science consultant for Santa Barbara Museum of Art: Winter-Spring, 2014: Consultant for astrophotography exhibit, Santa Barbara Museum of Art. Developed voice and music recordings for audio portions of astrophotography exhibit.

LAB MANUALS and WEB-BASED PUBLICATIONS:

van der Veen, J. (2014). The Planck Mission in Virtual Reality.

<http://web.physics.ucsb.edu/~jatila/Planck-Mission-Sim/>

van der Veen, J. and Lubin, P. (2004; revised 2010). Labs for a Lambda-Dominated Universe, web publication, <http://web.physics.ucsb.edu/~jatila/LambdaLabs/>

van der Veen, J. (2002). Multimedia text: Four chapters for CDRom for Astronomy On Line, Swinburne University of Technology: CMB Anisotropies: The Final Frontier; Introduction to CCD Imaging; Color and Temperature; Making an HR Diagram for a Star Cluster. See <http://astronomy.swin.edu.au/sao/common/devteam.xml>.

Fuller, T., van der Veen, J., & Lubin, P. (1995). Image Processing for High School and College Students, a publication of the Remote Access Astronomy Project, University of California at Santa Barbara; first printed November, 1993; revised August, 1995

INVITED TALKS WITH PUBLISHED ABSTRACTS:

van der Veen, J. (2013). Symmetry as a thematic approach to physics education, Symmetrion Conference, Delft, Netherlands, July, 2013.

van der Veen, J. (2013). Student-generated Representations of Special and General Relativity in an Interdisciplinary College Course. Invited paper, AERA Symposium Drawing scientific ideas: Student-generated representations as means of sense-making, communicating ideas, and meta-representational competence, April 28, 2013.

van der Veen, J. & Lubin, P. (2010). Symmetry and Aesthetics in Contemporary Physics: An Arts and Physics Curriculum. Amer. Assoc. of Phys. Teachers, February, 2010, Washington, DC. <http://www.aapt.org/AbstractSearch/FullAbstract.cfm?KeyID=17764>

van der Veen, J. (2006). . Amer. Assoc. for Adv. Science, June 19, 2006, San Diego, p. 97. <http://www.mudin.net/more-87th-annual-meeting-of-the-aaas-pacific-division-189331.html>

van der Veen, J., Lubin, P., & Fuller, T. (1999) Imagine-32: Versatile, Affordable Image Processing Software for the PC, 118th AAPT National Meeting: Anaheim, CA <http://www.aapt.org/AbstractSearch/FullAbstract.cfm?KeyID=8882>

van der Veen, J., Lubin, P., & Seiffert, M. (1998). Constraining Fundamental Cosmological Parameters by Understanding the Spectrum of Anisotropies in the Cosmic Microwave Background, in THE ANNOUNCER, American Association of Physics Teachers, v. 24, no.4, January, 1998.

CONTRIBUTED TALKS WITH PUBLISHED ABSTRACTS: 20, abstracts with citations available upon request.

van der Veen, J., Alper, B., Smith, W., McGee, R., Lubin, P., and Kuchera-Morin, J., and the Planck Collaboration (2011). The Planck Visualization Project: Seeing and Hearing the CMB. Paper presented at the 217th Annual Meeting of the American Astronomical Society, Seattle, WA, January 9 -13, 2011, Poster # P243.28.

INVITED KEYNOTE:

3 Nov. 2012: Draw your physics homework? Art as a path to Understanding in Physics Arts in Learning Symposium, California Lutheran University, Keynote speaker http://www.callutheran.edu/education/events/arts_learning_symposium.php

INVITED LECTURES and WORKSHOPS:

4 August, 2013: Folkdance as Culturally Situated Mathematics, Symmetry Festival, Delft, The Netherlands. <http://festival.symmetry.hu/programs/community-programs/>

26 May, 2012: Meta Institute for Computational Analysis (MICA), In-world invited speaker http://www.mica-vw.org/wiki/index.php/The_Planck_Mission:_Listening_to_the_Oldest_Light_of_the_Universe

16 March, 2012 Symmetry and Aesthetics in Contemporary Physics: A new paradigm for physics education, Media Arts & Technology graduate student seminar, UC Santa Barbara

4 April, 2012: Applied Research in Virtual Environments for Learning (ARVEL), In-world invited speaker <http://arvelsig.ning.com/page/inworlds-discussions>

16 April, 2011: Symmetry and Aesthetics in Contemporary Physics: An Interdisciplinary Arts and Physics Curriculum, Women in Physics Symposium, University of Oregon, invited speaker <http://pages.uoregon.edu/wits/wits/nwpc/schedule/>

7 January, 2011: Planck: Looking Back to the Dawn of Time, Listening to the Oldest Light of the Universe, Santa Barbara Museum of Natural History, invited public presentation

http://nightsky.jpl.nasa.gov/event-skychart.cfm?Event_ID=24827

20 May, 2010: Planck: Looking Back towards the Dawn of Time Institute for Terahertz Science and Technology, University of California, Santa Barbara, invited colloquium

24 April, 2010: *Planck Visualization Project: Seeing and Hearing the CMB* Southern California Section, American Association of Physics Teachers, Los Angeles, CA

<http://www.scaapt.org/meetings/2010mtg1spr/program.htm>

16 February, 2010: *Symmetry and Aesthetics in Contemporary Physics: An Interdisciplinary Arts and Physics Curriculum*, American Association of Physics Teachers National Meeting, Washington, D.C.,

AWARDS AND SCHOLARSHIPS:

NASA Postdoctoral scholar, 2007-2008, University of California, Santa Barbara

NASA – California Space Grant, 2007-2008

NASA Dissertation Fellowship, 2006-2007, University of California, Santa Barbara

Gevirtz Dissertation Scholar Fellowship awarded, spring quarter, 2007

Graduate Research Assistantship, Physics Department, UCSB, 2006-2007

Gevirtz Graduate School of Education, UCSB, Block Grants, 2004, 2005, 2006

American Association for the Advancement of Science, Pacific Division, First Place Award for student paper, *Physicists and Firewalkers: The Co-construction of Community Identity through Narratives in Ritual Performances*, June, 2006.

Block Grant, Gevirtz Graduate School of Education, University of California, Santa Barbara, awarded on basis of outstanding scholarship: 2004-2005; 2005-2006

Myra Sadker Curriculum Award from American University for outstanding curriculum development project, February 2004

Invited participant, Aspen Institute for Theoretical Physics Education conference, summer, 2004

UCSB Instructional Improvement Grant (\$16K) awarded for software development in astronomical image processing, April, 2002

Smithsonian Institute/American Institute of Indian Studies grant for travel and advanced study of classical dance in India November, 1986 - August, 1987