Nicole M. Gillespie
Knowles Science Teaching Foundation
1000 North Church Street
Moorestown, NJ 08057
Executive.Director@kstf.org
856-608-0001

Education

University of California, Berkeley
Ph.D. Education in Mathematics, Science & Technology — *December, 2004*
M.A. Education in Mathematics, Science & Technology — *December, 2002*

University of Washington, Seattle
M.S. Physics — *August, 1999*

U.S. Naval Academy, Annapolis, MD
B.S. Mechanical Engineering (minor in Russian) — *May, 1990*

Professional Experience

Executive Director and Trustee — *2013 - present*
Knowles Science Teaching Foundation, Moorestown, NJ

Responsible for oversight of 25-person staff, three programs and $7M annual budget and assuring that the organization has a long-range strategy which achieves its mission, and toward which it makes consistent and timely progress.

Director for Teaching Fellowships
Knowles Science Teaching Foundation, Moorestown, NJ — *2007-2011*

Developed and direct a unique, nationwide, five-year Teaching Fellows Program currently serving over 150 new high school science and math teachers. Responsibilities include managing a $4.5 million annual budget, program and staff development, public relations, and coordinating program evaluation and external research projects.

Senior Program Officer — *2004 - 2007*
Knowles Science Teaching Foundation, Moorestown, NJ

Managed all aspects of two cohorts of Science Teaching Fellows, including professional mentoring, planning 3 professional development meetings per year for five years, conducting teaching observations and providing feedback, and assessing yearly teaching portfolios.

Coordinated the design and implementation of a unique online application system for both the KSTF Teaching Fellowship Program and Young Scholars Program as well as an online management system to track all benefits and responsibilities associated with the 5-year Teaching Fellowship Program for up to 200 fellows each year.

Designed and administered the KSTF Young Scholars Fellowship (2005-2007) – a $110,000 research fellowship for

early-career scholars conducting research relevant the recruitment, retention, preparation, induction and mentoring of beginning high school science and math teachers. Responsibilities included the recruitment of applicants, solicitation and coordination of proposal reviewers, monitoring progress of research projects and planning professional development meetings for scholars.

Planned and implemented the KSTF Conference Series, including recruiting and coordinating an advisory committee, writing a successful proposal to hold the conference at Wingspread with support from the Johnson Foundation, planning conference logistics for the inaugural conference at Wingspread, contacting and inviting participants, designing the agenda, writing a chapter and preface for and editing conference proceedings, published in Summer 2008.

Teacher Education Experience

Instructor — *2009*

Graduate School of Education, University of Pennsylvania, Philadelphia, PA

Taught secondary science teaching methods to pre-service teachers in a graduate-level credential program

Instructor — *2006 – 2009*

Science Teacher Institute, University of Pennsylvania, Philadelphia, PA

Taught research-based inquiry physics course to Philadelphia-area middle school teachers in the Master's in Integrated Science Education (MISE) program

Mentor Teacher

Summerbridge/Breakthrough Collaborative, San Francisco University High School — *2004*

Mentor teacher to high school and college students teaching in national educational program that provides a path to college for high-potential, low-income middle-school students

Teaching Assistant — *1999*

1999 Summer Institute for Teachers, University of Washington, Seattle, WA

Co-taught *Physics by Inquiry* to in-service K-12 teachers

Scientist/Instructor — *1999*

Teacher Professional Development, Seattle Public School District, WA

Co-taught inquiry-based science methods to elementary school teachers as part of the NSF-funded Local Systemic Change project in the Seattle School District

Curriculum Developer — *2003*

Physics Education Research Laboratory, University of Maine, Orono, ME

Developed curriculum units for graduate-level physics education course for Masters in Science Teaching program

University Teaching Experience

Graduate Student Instructor — *2000 – 2002*

Physics Department, U.C. Berkeley

- Developed and taught reform-oriented introductory physics discussion and laboratory materials for an introductory physics course for life science, pre-med and architecture majors (approximately 600 students per semester)
- Awarded "Outstanding Graduate Student Instructor" by the Physics Department in May, 2001
- Led weekly training sessions and wrote lesson-specific teaching notes for graduate student instructors using new curriculum
- Head graduate student instructor for introductory physics course for engineering and physics majors
- Graduate student instructor for professional development course in teaching physics for new physics graduate students

Teaching Assistant — *1997 – 1999*

Physics Department, University of Washington

- Taught introductory physics tutorials and laboratories for calculus-based introductory physics sequence
- Developed new laboratory experiments for algebra-based introductory physics course
- Taught computational physics for physics majors, focusing on the use of *Mathematica* and *MatLab*

K-12 Teaching Experience

Instructor

Upward Bound Program, Napa Valley College, Napa, CA — *2000-2003*

- Physics teacher for high school summer program supporting students from under represented populations in higher education

Instructor and curriculum developer — *2001*

Academic Talent Development Program, U.C. Berkeley

- Instructor and curriculum developer for two sections of an 8th and 9th grade space science course in a summer enrichment program

Instructor — *1997 – 1999*

Chabad High School, Seattle, WA

- Courses taught: Physics, Biology, Earth Science & Algebra

1999 – 2004

Research Experience

Graduate Student Researcher

Graduate School of Education, U.C. Berkeley

- Designed and conducted study of collective argumentation among undergraduate physics students that led to dissertation

- Conducted, presented, and published research in conjunction with Professor diSessa's project on students' changing understanding of the concept of force, leading to a publication in *Cognitive Science*
- Participated in Professor diSessa's Boxer Research Group investigating the use of computational media in learning environments.

Graduate Student Researcher *2000 – 2003*
Physics Department, U.C. Berkeley

- Developed curriculum and implemented evaluation plan for reform-oriented introductory physics course
- Collaborated with physics faculty on planning and writing grant proposal submitted to the NSF Division of Undergraduate Education for Curriculum Adaptation and Implementation

Graduate Student Researcher
Center for Science Education, Space Sciences Laboratory, U.C. Berkeley *2000 – 2001*

- Developed education and public outreach web sites and curriculum for NASA space science missions

Corporate Experience

Customer Service Manager, Innova Corporation, Seattle, WA *1995-1997*

- Managed inside sales, marketing and customer service for engineering for start-up manufacturing high-frequency microwave radios for mobile telephone industry

Military Experience

Commissioned Officer, United States Navy (Ensign – Lieutenant) *1990-1995*

- Operations Watch Officer and High-Frequency Direction Finding Division Officer, Naval Security Group, Edzell, Scotland
- Assistant Director, Cryptologic Support Group, Joint Interagency Task Force East, Key West, FL

Other Professional Experience

Building Informal Science Education and Literacy Partnerships *2013-present*

- Advisory board member for NSF-funded partnership between the National Writing Project and the Association of Science-Technology Centers

Maine Math & Science Partnership *2010- present*

- Advise university, school and community partners in $12M NSF-funded teacher development project

National Task Force on Teacher Education in Physics *2009*

- Participated in site visits to create case studies documenting best practices for educating prospective and in service teachers in physics

Physics Education Research Conference *2005*

- Co-organized conference for approximately 250 researchers in Edmonton, Canada

Foundations and Frontiers in Physics Education Research Conference *2005*

- Organized working group to address issues of content preparation for secondary physics teachers

American Educational Research Association *2004*

- Served as chair and discussant in Division G sessions at annual meeting

2003

Enrico Fermi International School of Physics, Varenna, Italy

- Participated in the Italian Physical Society's course on physics education research

Peer-Reviewed Publications

Gillespie, N.M. (2014). *The Network Effect: How Teacher Leadership Can Improve STEM Education.* Manuscript submitted for publication.

Gillespie, N.M. (in press). Building a strong backbone for STEM education. *Phi Delta Kappan.*

Galosy, J. A., & Gillespie, N. M. (2013). Community, inquiry, leadership: Exploring early career opportunities that support stem teacher growth and sustainability. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 86(6), 207-215.

Collins, A. & Gillespie, N. (Eds.) (2009) *The continuum of secondary science teacher preparation: Knowledge, questions, and research recommendations.* Rotterdam: Sense

Gillespie, N. & Elby, A. (2009) Content preparation for physics teachers. In Collins, A. & Gillespie, N. (Eds.) *The continuum of secondary science teacher preparation: Knowledge, questions, and research recommendations.* Rotterdam: Sense

diSessa, A. A. , Gillespie, N. M. & Esterly, J. (2004). Coherence vs. fragmentation in the development of the concept of force. *Cognitive Science.*

diSessa, A. A. , Gillespie, N. M. & Esterly, J. (2004). Naïve meanings of force: Coherence vs. fragmentation. In R. Alterman and D. Kirsch (Eds.), *Proceedings of the 25th Conference of the Cognitive Science Society.* Mahwah, NJ: Erlbaum.

Banach, M., Brown, N., Carroll, C., Gillespie, N., Glaser, D., Hall, R., & Ryu, A. (2002). Constituting "missing objects" in learning conversations. In P. Bell, R. Stevens, & T. Satwicz (Eds.), *Keeping learning complex: The proceedings of the fifth international conference of the learning sciences (ICLS)* (pp. 606-610). Mahwah, NJ: Erlbaum.

Other Publications

Gillespie, N.M. (2014) How we created a network of STEM teachers. *Education Week* 33(20), 24-26.

Huffington Post Education Blog Contributions
(http://www.huffingtonpost.com/nicole-gillespie/)

- The Untapped Potential of Teacher Networks (July 10, 2014)
- What's In a Name? The Case for 'Leading Teacher' vs. 'Teacher Leader' (May 6, 2014)
- Why Teaching Needs to Be a Career, Not Just a Career Starter (February 12, 2014)

Invited Talks

Gillespie, N.M. (2014) "Community, Inquiry, Leadership: Opportunities that Support STEM Teacher Growth and Sustainability." Invited talk at the Physics Teacher Coalition Conference, Austin, TX.

Gillespie, N.M., (2013) "Inquiry and Teacher Professional Development: Lessons Learned from the KSTF Teaching Fellowship Program." Invited talks at the Maine Center for Research in STEM Education.

Gillespie, N.M., Echols, R. & Murphy, S. (2013) "Meeting Urban Science Students Where They Are: Perspectives from Two Physics Teachers and Four Schools". Invited talk at the American Physical Society Meeting, Baltimore, MD.

Gillespie, N. M. (2008) "Preparing and retaining high quality science and mathematics teachers: research, programs and results." Invited talk at the American Chemical Society Meeting, Philadelphia, PA

Gillespie, N.M. & Sabatier, C. (2007) "Preparing and retaining high quality science and mathematics teachers: research, programs and results." Invited talk at the Annual Meeting of the Acoustical Society of America, New Orleans, LA

Gillespie, N.M. (2006) "What we know about preparing secondary science teachers: a few facts, many assumptions and a great deal of unanswered questions." Invited talk at the Third Biennial National Summer Conference on Integrating Science and Mathematics Education Research into Teaching, Orono, ME

Gillespie, N.M. (2005) "What counts as convincing? Examples from Physics and Physics Education." Invited talk at the Winter meeting of the American Association of Physics Teachers, Albuquerque, NM.

Gillespie, N.M. (2004) "Knowing Thermodynamics: A study of collective argumentation among undergraduate physics students." Invited talk at the Physics Department Colloquium Series, University of Maine, Orono.

Gillespie, N. M. (2003). "The Emergence of Model-Based Reasoning in Classroom Discourse." Invited talk at the Physics Education Research Group Seminar, University of Maryland, College Park, MD.

Gillespie, N. M., Wittmann, M. & Scherr, R. E. (2003). "The Negotiation of Relevance in a Clinical Interview." Invited talk at the annual meeting of the American Association of Physics Teachers, Austin, TX.

Gillespie, N. M. , diSessa, A. A. & Esterly, J. (2002). "Investigating Students' Changing Understanding of Force." Invited talk at the Physics Education Research Laboratory Colloquium Series, University of Maine, Orono.

Gillespie, N. M. , diSessa, A. A. & Esterly, J. (2001). "Investigating Students' Understanding of Force Across Time and Context." Invited talk at the Physics Education Group Colloquium Series, University of Washington, Seattle.

Presentations

Gillespie, N. & Rostock, R. (2010) "Moving beyond retention: Setting the stage for the next generation of teacher leaders". Presentation at the Annual Meeting of the National Science Teachers Association, Philadelphia, PA.

Gillespie, N. M. (2005). "The construction and evolution of professional identity: A five-year study of novice science teachers in a teaching fellowship program." Data presented at the 26th Annual Ethnography in Education Research Forum, Philadelphia, PA.

Gillespie, N. M. (2004). "Knowing thermodynamics: A study of collective argumentation among physics students." Poster presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Gillespie, N. M. (2003). "Argumentation and consensus in the activity of knowing thermodynamics." Presentation at the Mathematical Association of America Conference on Research in Undergraduate Mathematics Education, Scottsdale, AZ.

Gillespie, N. M. (2003). "Examining the emergence of model-based reasoning in interaction." Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Gillespie, N. M. (2002). "Bouncing balls and kinetic theory: Model-based reasoning as an emergent process." Presentation at the Center for Science and Mathematics Education and Research Conference, Orono, ME.

Gillespie, N. M. , diSessa, A. A. & Esterly, J. (2002). "The meaning of force: investigating children's changing ideas." Presentation at the annual meeting of the American Association of Physics Teachers, Philadelphia, PA.

Gillespie, N. M. & Craig, N. (2001). "Using space science as a framework for teaching particulate models of matter." Poster presented at the joint meeting of the American Association of Physics Teachers and the American Astronomical Society, San Diego, CA.

Gillespie, N. M.. , diSessa, A. A. & Esterly, J. (2001). "The meaning of force: Investigating children's changing understanding across time and context." Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA

Reviews

Journal of the Learning Sciences
Journal of Research in Science Teaching
American Educational Research Association – Division G (Social Context of Education)
Applied Linguistics
National Association of Research in Science Teaching – Strand 10 (Higher Education)

Honors and Awards

Spencer Dissertation Fellowship (2003-4)
Spencer Research Training Grant Fellowship (2000-1; Fall, 2002)
Outstanding Graduate Student Instructor, U.C. Berkeley Physics Department (2000-1)
National Science Foundation, Science and Design Fellowship (1999-2000, 2000-1)
University of California Regents Fellowship (1999-2000, 2000-1, 2001-2, 2003-4)
California Space Grant Fellowship (Summer, 2000)

Professional Affiliations

American Association of Physics Teachers (AAPT)
American Educational Research Association (AERA)
Association of Science Teacher Educators (ASTE)
National Association of Research in Science Teaching (NARST)
Fellowship Roundtable
Philanthropy Roundtable
Grantmakers for Education (GFE)
Leadership Philadelphia – Class of 2009