

CURRICULUM VITA

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ACADEMIC BACKGROUND

<i>Degree</i>	<i>Institution</i>	<i>Year</i>	<i>Program</i>
Ph.D.	University of Maryland College Park, Maryland	1983	Science Education
M.A.T.	Michigan State University East Lansing, Michigan	1980	Geology
B.S.	University of Maryland College Park	1974	Earth Science Education

PROFESSIONAL EXPERIENCE

2012 – present	Director, NSF Division of Research on Learning in Formal and Informal Settings [Two-Three Year Rotation started Nov. 2012]
2008 – present	Waterbury Chair in Secondary Education, Professor of Science Education, College of Education, Penn State University
2004 - 2008	Professor of Science Education, GSE; Member Executive Committee - Rutgers Center for Cognitive Sciences,
1999-2004	Chair of Science Education, King's College London
1995 - 1999	Professor of Science Education, Vanderbilt University
1991 - 1995	Associate Professor with tenure, University of Pittsburgh
1991 - 1992	Curator for Science Exhibits - Children's Museum of Houston, Houston, Texas
1989 - 1991	Assistant Professor, University of Pittsburgh
1987 - 1989	Associate Professor (Non-tenured), Hunter College of CUNY
1983 - 1987	Assistant Professor, University of Houston- Univ. Pk.

1986 - 1987	Coordinator Science Education Programs, The Children's Museum of Houston.
1981 - 1983	Graduate Research Assistant, Dean's Office, College of Education, University of Maryland - College Park.
1978 - 1981	Teaching Assistant, Department of Geology, University of Maryland-College Park
1979 - 1983	Intern, Maryland State Department of Education, Baltimore.
1976 - 1978	Earth Science Teacher, McDonough HS, Charles County Board of Education, LaPlata, MD

Contributions to Science Education

Professor Duschl's academic career has provided opportunities to collaborate with and learn from leading scholars in science education, learning sciences and science studies. From his first 1981 NARST conference as a graduate student, to the recent participation chairing the National Research Council committee that produced the synthesis report *Taking Science to School* and now in the current position as Director, Division of Research on Learning at NSF, his career is defined by collaborations and scholarly interactions with others.

His research has focused on establishing and understanding science learning environments and the role of teachers' and students' inquiry and argumentation processes. Richard has twice received the 'JRST Award' (1989; 2003) for the outstanding research article published in the *Journal of Research in Science Teaching*. There are 3 themes to his research: (1) How the history and philosophy of science can be applied to science education. Here the agenda is to better understand the social and cognitive dynamics for the growth of knowledge can be applied to making science classrooms inquiry and epistemic communities. (2) How the design of extended curriculum and teaching sequences can promote 'assessment for learning' instructional models. With NSF support from several grants, this research has led to many new ideas about how formative assessment strategies can help learners and teachers make scientific thinking visible and thereby mediate the development of learning and reasoning. (3) How argumentation and discourse frameworks help promote instruction-assisted development and science learning. An emerging theme of these scholarly efforts has been the development of teaching science as three-part harmony attending to conceptual, epistemic and social (critique and communication) learning goals.

Awards & Funded Research

Fellow of the American Educational Research Association, Elected 2009

Distinguished Alumnus of the Year College of Education, University of Maryland Alumni Association, April, 2007.

Outstanding Scholar, College of Education Alumni Association, University of Maryland, November, 2006.

Distinguished Alumni, College of Education, University of Maryland, College Park. 1995.

Recipient of the 2003 JRST Award from the National Association for Research in Science Teaching. Awarded to the author(s) of the manuscript judged the most outstanding contribution for Volume 40 of the *Journal of Research in Science Teaching*.

Recipient of the 1989 JRST Award from the National Association for Research in Science Teaching. Awarded to the author(s) of the manuscript judged the most outstanding contribution for Volume 26 of the *Journal of Research in Science Teaching*.

Grants

“Promoting Conceptual Change in Reasoning” Clark Chinn & Richard Duschl, National Science Foundation ROLE Grant. Award #: 0529582 Award Amount: \$890,000; 2005-2008, 2007 supplement award \$200,000.

“Inquiry Conference on Developing a Consensus Research Agenda Richard Duschl & Richard Grandy, National Science Foundation Grant Award#: 0343196 Current Year Award Amount: \$91,790; 2003-2005.

"King's College London/Weizmann Institute of Science Secondary Science Continuing Professional Development Project." With Jonathan Osborne, Bat-Sheva Eylon, Avi Hofstein. Gatsby Foundation, UK. \$500,000. 2002-2005.

NSF Centers for Teaching and Learning - "Center for Informal Learning and Schools - CILS". Exploratorium, King's College London, UC-Santa Cruz. Rob Semper, Richard Duschl, Joyce Justice & Lynda Goff, Principal Investigators. National Science Foundation, \$10.8 million - 2001-2006.

"Tracking the Fate of Evidence and Ideas Among Collaborative Groups in Technology-Supported Assessment Contexts". NSF - Center for Innovation in Learning Technology (CILT). \$10,000 - 2000-2001. With Dan Hickey, University of Georgia

"Comparing whole class, small group and computer supported science discourse". NSF - Center for Innovation in Learning Technology (CILT). \$10,000 - 1998-1999. With Susan Goldman, then at Vanderbilt University and now at University of Illinois, Chicago.

“National Center for Student Learning and Achievement in Mathematics and Science”. Vanderbilt University Middle School Study Group, with Paul Cobb and Angelo Collins as part of the University of Wisconsin-Madison proposal - Tom Romberg, Principal

Investigator. Office of Educational Research and Improvement, Department of Education. \$ 1.75 million - 1996

"Portfolio Culture: An Alternative Assessment & Instructional Approach in Science." NSF Materials Development and Informal Science Program - Research on Teaching and Learning. \$877,047.00 - 1991-1994. With Drew Gitomer, ETS.

"African-American Recruitment Program" Department of Education, Pennsylvania. \$87,000.00 - 1990.

"An investigation of the knowledge bases and decision-making models used in beginner teacher's planning." Buhl grant, School of Education, University of Pittsburgh. \$9,457.00 - 1990.

"A Study of the planning strategies and designs used by teachers with different conceptions of the nature of science." Faculty Research Opportunity Grant, University of Houston College of Education. \$340.00 - 1986.

Limited Grants-in-Aid; University of Houston. For presentation of research proposal to NSF, "Computer-enhanced reasoning in middle school science programs," with B. Foorman. \$800.00 - 1986.

"Teacher development program for middle school teachers of math and science." Coordinating Board of Texas/Education for Economic Security Act. Co-Director with Jack Creswell. \$466,000.00 -1985.

Books & Reports

Duschl, R. & Grandy, R. (Eds.) (2008) *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.

Duschl, R., Schweingruber, H., & Shouse, A., (Eds.), (2007). *Taking Science to School: Learning and Teaching Science in Grades K-8*. Washington, DC : National Academies Press.

Harrison, C., Black, P., Osborne, J. & Duschl, R. (2004). *Assessment of Science Learning 14-19: A report to the Royal Society*. London: Royal Society.

Osborne, J. F., Duschl, R., & Fairbrother, R. (2002). *Breaking the Mould: Teaching Science for Public Understanding*. Nuffield Foundation. Available: <http://www.kcl.ac.uk/education/hpages/jopubs.html>.

Duschl, R. (1997). *Renovar La Enseñanza de las Ciencias*. (Spanish Translation *Restructuring Science Education: The Importance of Theories and Their Development* by Victor Alvarez Perez y M.Pilar Jimenez Aleixandre) Madrid: Narcea, S.A. De Ediciones.

Duschl, R. & Hamilton, R. (Eds.) (1992). *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice*. Albany, NY: SUNY Press.

Duschl, R. (1990). *Restructuring Science Education: The Importance of Theories and Their Development*. New York: Teacher's College Press.

Handbook Chapters

- Duschl, R. & Hamilton, R. (2011). Learning, Science. In R. Mayer & P. Alexander, Eds.) *Handbook of Research on Learning and Instruction*. (pp. 78-107). New York: Routledge, Taylor & Francis Group.
- Duschl, R. & Hamilton, R. (1998). Conceptual Change in Science and in the Learning of Science. In B. Fraser and K. Tobin, (Eds.), *International Handbook of Science Education*. (p,p 1047-1065). Dordrecht: Kluwer Academic Publishers.
- Gitomer, D. & Duschl, R. (1998). Emerging Issues and Practices in Science Assessment. In B. Fraser and K. Tobin, (Eds.), *International Handbook of Science Education*. (pp. 791-810). Dordrecht: Kluwer Academic Publishers..
- Duschl, R. (1994). Research on the History and Philosophy of Science. In D. Gable, Ed., *Handbook of Research in Science Teaching*. (pp. 443-465). New York: Macmillian.

Chapters in Edited Books

- Duschl, R. & Jimenez-Aleixandre, M. P. (2012). Epistemic foundations of conceptual change. In S. Carver & J. Shrager, Eds., *The Journey from Child to Scientist: Integrating cognitive development and the education sciences*. (pp. 245-262). Washington, DC: American Psychological Association.
- Duschl, R. & Grandy, R. (2011). Demarcation in Science Education: Toward an Enhanced View of Scientific Method. In R. Taylor & M. Ferrari, Eds, *Epistemology and Science Education: Understanding the Evolution vs. Intelligent Design Controversy*. (pp 3-19) New York: Routledge Taylor & Francis Group.
- Duschl, R. & Duncan, R. G. (2009). Beyond the fringe: Building and evaluating scientific knowledge systems. In T. Duffy & S. Tobias (Eds.) *Constructivist theory applied to instruction: Success or Failure?* (pp 311-332). London: Taylor & Francis.
- Duschl, R. & Grandy, R. (2008). Reconsidering the character and role of inquiry in school science: Framing the debates. In R. Duschl & R. Grandy, Eds., *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.
- Grandy, R. & Duschl, R. (2008). Consensus: Expanding scientific method and school science. In R. Duschl & R. Grandy, Eds., *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers.
- Gitomer, D. & Duschl, R. (2007). Establishing multi-level coherence in assessment. In P. Moss (Ed.). *Evidence and decision making, NSSE 2007 Yearbook*, V106, Issue 1.
- Duschl, R. (2007). Quality argumentation and epistemic criteria. In S. Erduran & M. Jimenez-Aleixandre, Eds. *Argumentation in Science Education: Perspectives from classroom-based research*. Dordrecht Netherlands: Springer.
- Duschl, R. (2005). Using and Abusing: Relating History of Science to Learning and Teaching Science. In L. Flick & N. Lederman, Eds., *Scientific inquiry and Nature*

- of Science: Implications for teaching, learning and teacher education.* Dordrecht, The Netherlands: Kluwer Academic Press.
- Duschl, R. (2003). The Assessment of Argumentation & Explanation: Creating and Supporting Teachers' Feedback Strategies. In D. Zeidler, Ed., *The Role of Moral Reasoning on Socio-Scientific Issues and Discourse in Science Education.* Dordrecht, The Netherlands: Kluwer Academic Press.
- Duschl, R. (2003). Assessment of Inquiry. In M. Atkin & J. Coffey Eds., *Everyday Assessment in Science Classrooms.* Washington, DC: NSTA Press.
- Goldman, S., Duschl, R., Ellenbogen, K., Williams, S. & Tzou, C. (2003). Science inquiry in a digital age: Possibilities for Making Thinking Visible. In H. van Oostendorp (Ed.) *Cognition in a Digital Age.* Mahwah, NJ: Erlbaum Publishers.
- Duschl, R. (2002). Making scientific thinking visible: The role of evidence diversity and theory articulation. In T. Koschmann, R. Hall & N. Miyake (Eds.) *CSCL 2: Carrying Forward the Conversation.* Mahwah, NJ: Erlbaum Publishers. pp 487-492.
- Duschl, R. & Smith, M. (2001). Earth Science. In J. Brophy (Ed.) *Subject-Specific Instructional Methods and Activities; Advances in Research on Teaching, V 8.* (pp. 269-290) Oxford: Elsevier Science Ltd.
- Duschl, R. (2000). Making the nature of science explicit. In R. Millar, J. Leech & J. Osborne (Eds.) *Improving Science Education: The contribution of research.* (pp 187-206). Philadelphia: Open University Press.
- Duschl, R. & Erduran, S. (1996). Modelling the growth of scientific knowledge. In G. Welford, J. Osborne, & P. Scott (Eds.) *Research in Science Education in Europe: Current Issues and Themes* (pp 153-165). London: Falmer Press.
- Duschl, R. & Feather, R. (1996). Developing and nurturing objectivity in science classrooms. In F. Finley, et al (Eds.), *Third International Conference History, Philosophy of Science and Science Teaching,* Minneapolis, MN October 29 - November 1, 1996. Minneapolis: University of Minneapolis.
- Gitomer, D. & Duschl, R. (1995). "Portfolio Culture Science". In S. Glynn & R. Duit, (Eds.), *Applying science education research to the classroom.* Hillsdale, NJ: Erlbaum Press.
- Duschl, R. (1993). "An Inquiry into the plausibility of competing explanations about earthquakes." In K. Kachman & C. Sutton, (Eds.) *Curriculum reform in college science: Applying historical cases of theory change.* Monograph prepared for Radford Conference, Radford College, VA.
- Duschl, R. & Hamilton, R. (1993) Introduction - Viewing the Domain of Science Education. In R. Duschl & R. Hamilton (Eds.), *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice.* Albany, NY: SUNY Press
- Duschl, R., Hamilton, R., & Grandy, R. (1993). Tension issues between epistemological and psychology frameworks in Science Education. In R. Duschl & R. Hamilton (Eds.), *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice.* Albany, NY: SUNY Press.
- Duschl, R. & Waxman, H.C. (1991). Impacting the Learning Environments of Student Teaching: Investigations with Preservice Teachers. In B. Fraser and H. Walberg, (Eds.), *The Study of Learning Environments,* pp. 255-270. London: Pergamon Press.

- Duschl, R. (1988). Improving science teacher education programs through the inclusion of history and philosophy of science. In J. Barufaldi, (Ed.), 1987 *Association of Educators of Teachers of Science Yearbook*, pp. 1-24. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education.
- Waxman, H. & Duschl, R. (1987). Using student perception data to assess teaching effectiveness of student teachers. In B. Fraser (Ed.) *The Study of Learning Environments, Vol.2*, pp. 72-79. Perth: Curtin University of Technology.
- Duschl, R. (1986) The changing concept of scientific observation. In R. Bybee (Ed.) *1985 NSTA Yearbook*, pp. 16-22. Washington, DC: National Science Teachers Association.
- Duschl, R. (1985) Preservice science teacher education and history of science. In R. James (Ed.) *1985 AETS Yearbook*, (pp. 16-22). Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education.

Articles (*indicates refereed journals)

- *Duschl, R. & Grandy, R. (2013) Two views about explicitly teaching nature of science. *Science & Education*, 22:9, 2109-2140.
- Duschl, R. (2012). The second dimension – crosscutting concepts: Understanding ‘A Framework for K-12 Science Education.’ *Science & Children* 49:6, 10-14.
- Duschl, R. (2011). Guest Editorial – The changing landscape of assessment. *Science and Children, Summer* 2011, 8-9.
- *Duschl, R. Maeng, S., & Sezen, A. (2011). Learning progressions and teaching sequences: A review and analysis. *Studies in Science Education*, 47 (2), 119-177.
- * Duschl, R. & Ellenbogen, K. (2009). Argumentation and Epistemic Criteria: Investigating Learners’ Reasons for Reasons. *Educacion Quimica*, April, 111-118.
- *Utz, A. & Duschl, R. (2009). SENCERing Preservice K-8 Teacher Education. *Science Education and Civic Engagement*, 2:1, 29-37
- *Duschl, R. (2008). Science education in 3 part harmony: Balancing conceptual, epistemic and social learning goals. *Review of Research in Education*, V32. (pp. 268-291) Washington, DC: AERA.
- Grandy, R. & Duschl, R. (2007). Reconsidering the Character and Role of Inquiry in School Science: Analysis of a Conference. *Science & Education*, 16(1).
- Duschl, R., Shouse, A., Schweingruber, H. (2007). What research says about K-8 science learning and teaching. *Principle*, Nov/Dec.
- Ke, J.L., Monk, M. & Duschl, R. (2005). Learning introductory quantum mechanics: Sensori-motor experience and mental models. *International Journal of Science Education*. 27(13).
- *Erduran, S. & Duschl, R. (2004). Interdisciplinary characterizations of models and the natural chemical knowledge in the classroom. *Studies in Science Education*, 40, 111-144.
- Osborne, J. F., Ratcliffe, M., Collins, S., Millar, R., & Duschl, R. (2003). What 'ideas-about-science' should be taught in school science? A Delphi Study of the 'Expert' Community. *Journal of Research in Science Teaching*, 40(7), 692-720.
- [Received JRST Award for Most Significant Contribution to Volume 40].**

- * Duschl, R. (2002). New Drivers for New Science Education Highways. *Canadian Journal of Science, Mathematics and Technology Education*, 2(2), 219-224.
- *Duschl, R. & Osborne, J. (2002). Argumentation and Discourse Processes in Science Education. *Studies in Science Education*, 38. 39-72.
- *Duschl, R. (2001). Earth System Science: A better way to each science enquiry. *Teaching Earth Science*, 26(3), 89-93.
- *Jimnez-Aleixandre, M.P., Rodrigues, A. B., & Duschl, R.A. (2000). "Doing the lesson" or "doing science": Argument in high school genetics. *Science Education*, 84(6), 757-792.
- * Duschl, R.A., Deak, G.O., Ellenbogen, K.M. & Holton, D.L. (1999). Developmental and educational perspectives on theory change: To have and hold, or to have and hone? *Science & Education*, 8, 525-541.
- *Duschl, R. A. (1998) La valoracion de argumentaciones y explicaciones: Promover estrategias de retroalimentacion. [Designing curriculum and assessments that establish and nurture argumentation, explanation and modelling] *Ensenanza De Las Ciencias*, 16(1), 3-20.
- *Duschl, R. & Gitomer, D. (1997). Strategies and challenges to changing the focus of assessment and instruction in science classrooms. *Educational Assessment*, 4, (1), 37-73.
- *Schauble, L., Glaser, R., Duschl, R. Schulze, S. & John, J. (1995). Students' understanding of the objectives and procedures of experimentation in the science classroom. *The Journal of the Learning Sciences*, 4(2), 131-166.
- Adams, K., Gitomer, D., & Duschl, R. (1995). Rethinking teaching through assessment in middle school science. *Science Scope*, 18(7), 18-21.
- *Duschl, R. (1995). Beyond cognition: The epistemic and social challenges of conceptual change teaching. *Ensenanza de las Ciencias*, 13(1), 3-14.
- Rosato, N., Gitomer, G. & Duschl, R. (1994). Showing understanding and revising ideas" Strategies for developing science portfolios. *Portfolio News*.
- Subotnik, R. & Duschl, R. (1993). Investigating the career choice of Westinghouse Science Talent Winners: A longitudinal study. *International Journal of Science Education*, 15(1), 61-72.
- *Duschl, R. & Gitomer, D. (1991). Epistemological Perspectives on Conceptual Change: Implications for Educational Practice. *Journal of Research in Science Teaching*, 28(9), 839-858.
- *Duschl, R., Hamilton, R. & Grandy, R. (1990). Psychology and epistemology: Match or mismatch when applied to science education? *International Journal of Science Education*, 12(3), 230-243.
- *Lythcott, J. & Duschl, R. (1990). Qualitative research: From method to conclusions. *Science Education*, 74, 445-460.
- Duschl, R. (1990). Teaching of theory as a concept in science education. Commissioned paper to Biological Science Curriculum Study as part of NSF Grant "History and Nature of Science and Technology in Science and Social Studies."
- *Duschl, R. & Wright, E. (1989). A Case Study of High School Teachers' Decision Making Models for Planning and Teaching Science. *Journal of Research in Science Teaching*, 26(6), 467-501. [Received JRST Award for Most Significant Contribution to Volume 26].

- * Duschl, R. (1989). Comments on "Analyzing hierarchical relationships among modes of cognitive reasoning and integrated process skills". *Journal of Research in Science Teaching*, 26(5), 381-384.
- * Duschl, R. (1988). Abandoning the scientific legacy of science education. *Science Education*, 72(1), 51-62.
- * Duschl, R. (1987). Causes of Earthquakes: Inquiry into the plausibility of competing explanations. *Science Activities*, 24(3), 8-14.
- Duschl, R. (1987). Planning triads for effective sequencing of instructional tasks. *The Texas Science Teacher*, 16(4), 15-19.
- Duschl, R. (1987). Extended abstract and analysis of "Laboratory teaching skills for secondary science teachers coming to grips with the problems of Laboratory Instruction. *Investigations in Science Education*, 13(1), pp. 9-17.
- Stone, M. & Duschl, R. (1987). Elementary level science inservice activities: An analysis and evaluation of a cumulative staff development program. *Southwest Journal of Education Research into Practice*, 1, 15-19.
- * Duschl, R. (1986). Textbooks and the teaching of fluid inquiry. *School Science and Mathematics*, 86(1), 27-32.
- * Duschl, R. (1986). New science curricula and philosophy of science. *The Education Digest*, March, 40-43. **[Reprint of *School Science and Mathematics*, 85(7) article].**
- * Duschl, R. (1985). Teaching data process skill using wood blocks. *Science Activities*, 22(4), 26-29.
- Duschl, R. (1985). Putting scientific theories and fact into a proper perspective in science courses. *The Texas Science Teacher*, 14(4), 11-15.
- * Duschl, R. (1985). Science education and philosophy of science: Twenty-five years of mutually exclusive development. *School Science and Mathematics*, 85(7), 541-555.
- Duschl, R. (1985). Extended abstract and analysis of "Using the science classroom learning environment for improving instruction." *Investigations in Science Education*. 11(1), 32-43.
- * Duschl, R. (1983). The elementary-level science methods course: Breeding grounds for an apprehension toward science? *Journal of Research in Science Teaching*, 20(8), 745-754.
- * Duschl, R. (1983). Equal-time requests: Implication for teachers and science curricula. *School Science and Mathematics*, 83(4), 299-306.
- * Duschl, R. (1983). Comments on "An analysis of prospective science teachers' understanding of the nature of science." *Journal of Research in Science Teaching*, 20(4), 373-374.

Leadership in Science Education

Leadership experiences include several years as an Earth Science teacher in Charles Co. Maryland; President, Maryland Association of Science Teachers; NARST Board of Directors; Chair, NARST Publications Committee; Member and Chair, NARST Distinguished Career Award Committee; Editor, *Science Education*; Associate Editor, *Cognition and Instruction*; Editor, 'Ways of Knowing in Science and Mathematics' Book Series, Teachers College Press; Member, 2009 NAEP Science Framework Planning Committee; Chair, NSF Delegation for US/UK STEM Workforce Initiatives Conferences; Member, College Board, AP Reforms, Learning Sciences Group; NRC K-8 Study Committee, Chair; NARST President; Next Generation Science Standards, Co-chair, Earth/Space Sciences writing team; Building Capacity in State Science Education, Member, Advisory Board.

Dr. Duschl has served for 10 years as the editor of *Science Education*, an international journal of research and scholarship in science education. He also was editor of the Teachers College Press book series "Ways of Knowing in Science" and as Associate Editor of *Cognition and Instruction*. Over the years, Richard has been involved in informal science education, too, as Co-PI of the NSF Center for Informal Learning and Schools, serving on the Advisory Boards of the NJ Liberty Science Center and the Cumberland Science Center, Nashville, TN and as curator for science exhibits at the Children's Museum of Houston.

NARST

Past President: 2008-2011.

JRST Awards Committee 1985-1988 & 1991-1993).

Member - Executive Advisory Board 1992-1995;

Chair, Publications Committee, 1992-1995;

Member Elections Committee, 1998-2000.

Member - Distinguished Research Committee 2001-2006; Co-chair 2006; Chair 2006

AERA

Member: Early Career Award Committee 2003-2005

Faculty Advisor: Division C Graduate Students Association 1999-2001.

Chair: Informal Learning SIG 2002 to 2004.

Program Chair: Subject Matter Knowledge and Conceptual Change SIG 1990 & 1991 meetings.

Program Chair: The Study of Learning Environments SIG 1988 meeting.

OTHER

Chair: National Research Council Study Committee "Science Learning Study K-8th Grades" 2004 – 2007. Produced the report *Taking Science to School*.

Member: National Research Council Advisory Board, *Inquiry Addendum, National Standards Science Education*, 1998-2000.

Member: Planning Committee, 2009 NAEP Science Framework

Member: National Leadership Team and Co-Chair Earth/Space Sciences Writing Team,
Next Generation Science Standards, Achieve, Inc. 2010-2013.

Evaluator: S-TEAM (Science Teaching Advanced Methods), European Union Project.
Doris Jorde, PI. 2009-2012.

President: Maryland Association of Science Teachers (MAST) 1981.

Editorships, Editorial Boards and Reviewing

Editor: *Science Education*, 1992-2001.

Book Series Editor: Teacher's College Press, 'Ways of Knowing in Science'. 1994-2004

Associate Editor: *Cognition & Instruction*, 2003-2008.

Current Reviewing:

The Journal of the Learning Sciences, Editorial Board member

Cognition & Instruction – Editorial Board member

Science Education – Editorial Board member emeritus

Studies in Science Education – Editorial Board member

Science & Education – Editorial Board member

International Journal of Science and Mathematics Education – Editorial Board Member

Reading Research Quarterly – reviewer

American Journal of Education – reviewer

Educational Researcher – reviewer

Keynote and Invited Lectures

“Promising Practices in Undergraduate Science and Engineering Education: Why don't we implement them?” **Keynote Address**, ASOL, New Orleans, March, 2013.

“Framing the Learning/Teaching of Science and Nature of Science.” **Invited Address**.
NSF Conference 'History of Science and Science Education'. Boston University,
December, 2012.

“Building Refining and Defining Learning Outcomes.” **Keynote Address**. Georgia
State System STEM Conference, Georgia Southern University. March 2012.

“Planning and Carrying Out Investigations” **Invited Address**. NSTA Compass Webinar,
October 9, 2012.

“Crosscutting Concepts (C³): Melding Mechanisms, Models, and Minds.” **Invited
Address**, Building Capacity in State Science Education (BCSSE), Nashville, TN,
September, 2011.

“Creating a Theoretical Framework & Using Literature Reviews Effectively.” **Invited
Address**, NARST, Sandra Abell Institute for Doctoral Students, Boulder, CO, July 2011.

“STEM S T E M What's the Glue?” **Keynote Address** Central PA STEM Conference,
Johnstown, PA July 15, 2011.

“How Science Works” **Keynote Address**, International workshop on science teaching and history and philosophy of science, Aarhus University, Denmark, June 2011.

“Teaching Scientific Inquiry.” **Keynote Address**, Norwegian Science Teachers National Workshop, Oslo, Norway, May, 2011.

“Teaching Scientific Inquiry: Sorting Out the Particulars to Harmonize the Practices.” **Keynote Address**, National meeting NSTA-Shell Seminar Series, San Francisco, April, 2011.

“Instruction Assisted Development of Inquiry: The Dual Space of Philosophy and Psychology,” **Keynote Address** 8th Conference of ERIDOB – Braga, Portugal. July 2010.

“New Visions of Science Education: Inching Our Way Common Standards.” **Keynote Address**. Nat’l Science Education Leadership Association, Summer PD Institute, Flagstaff, AZ June 2010.

“Aligning Practices, Philosophies and Pedagogies: New Science Education Models from the Learning Sciences.” **Invited Address**. Council of State Science Supervisors Annual Meeting, Philadelphia, PA April 2010.

“20th Century Parade of Science Education.” **Keynote Address**. Illinois Science Teachers Association Annual Conference. Peoria, IL Nov 2009.

“Assessing Science Learning” Invited Address/Seminar. National Changhua University of Education, Taiwan, October, 2009

“The 20th Century Parade of Science Education: Progress and Its’ Problems.” **Keynote Address** – 40th Anniversary University of Wyoming, Center for Math and Science Education, Laramie, WY October, 2009.

Teachers and Teacher Education: A SENCER Model Aligning Core Ideas and Science Practices. **Invited Address**, SENCER Summer Conference, Asheville, NC, August 2009.

“Aligning nature of science and inquiry learning and teaching.” **Keynote address** SIG Science Education at the annual meeting of AERA April 2005, Montreal.

“Bridging Out-of-School and School Learning, **Invited Address** University of San Sebastian summer school "Los Museos de la Ciencia y la Alfabetizacion Cientificia en el Siglo XXI" (Science Museums and Scientific Literacy in the 21st Century). San Sebastian, Spain. July 2002.

New Trends in Education Research: Designing Learning Environments. **Invited Address.** Portugal Science Education Conference, Viseau, Portugal, March 2002.

“Assessing Science Learning in 3 Part Harmony.” **Keynote Address** Center for Assessment and Evaluation of Science Learning (CASEL) NSF Center for Teaching and Learning Summer Leadership Meeting, June 2001.

"Tracking Data in Model-Based Science", **Invited Address** Museu de la Ciencia Seminar, Barcelona, Spain. April, 2000.

Keynote Address, 1st Pan Hellenic Science Education Research Conference, Thessaloniki, Greece. 1998.

“The Assessment of Argumentation & Explanation: Creating and Supporting Teachers’ Feedback Strategies”. **Keynote Address** Vth Congreso Internacional sobre. Investigacion En Las Didactica De Las Ciencias Y De Las Mathematicas, Universidad Autonoma de Murcia, Spain. September, 1997.

"Beyond cognition: The epistemic and social challenges of conceptual change teaching." **Keynote Address** IVth Congreso Internacional sobre. Investigacion En Las Didactica De Las Ciencias Y De Las Mathematicas, Universidad Autonoma de Barcelona, Spain. September, 1993.

"Psychology and epistemology - Match or mismatch when applied to science education" with R. Hamilton and R. Grandy. **Invited Plenary Session.** International Conference on the History and Philosophy of Science in Science Teaching. Florida State University, November 6-11, 1989.

Impact on science education

Synergistic Activities

1. Next Generation Science Standards – Member National Leadership Team; Co-chair Earth/Space Science Writing Team – 2010 – present.
2. National Research Council – 2004 –2007; Chair, Committee on Science Learning Study – K-8; *Taking Science to School: Learning and Teaching Science in Kindergarten to Eight Grade*, Washington, DC: National Academies Press.
3. National Assessment Governing Board – 2003 – 2010; Member Planning Committee 2009 NAEP Science Assessment framework; Member Science Standing Committee, Member ALD Committee.
4. Member, 2007-2008; Learning Sciences Panel for College Board AP Science reforms; Member AP Earth/Environmental Sciences reform panel.
5. Co-PI, NSF, CTL, Center for Informal Learning and Schools (CILS). Exploratorium, King's College London, UC-Santa Cruz. Developed proposal and served as KCL Principal Investigator for 3 years. Established collaborative research sites and agendas with Science Museum of London, Natural History Museum and the London Zoo, recruitment and matriculation of 4 doctoral students and 2 postdocs.

Intellectual Contributions

Assessment Conversation discourse framework and methodology
Argumentation – Walton's Presumptive Reasoning Framework
Epistemic Goals in Science Learning
Portfolio Assessment Models and Methodology
Learning Progression Synthesis Review
History and Philosophy of Science and Science Education

Graduate Students

Ph.D. Schools

Participant

University of Oslo, Ph.D. Program, Oslo, Norway - 3 day course; (2008)

Sweden National Ph.D. School, Soddershoppen, Sweden – 3 day course; (2003)

NARST Sandi Abell Ph.D. Summer School, Boulder, CO USA (2011)

Doctoral Students:

Chair

Yann Soon Ong, in progress, Penn State University.

Jennifer Collymore, 2012, Penn State University Department of Geography (Co-chair).
(Faculty Member - University of West Indies)

Jim Neufell, 2007, Rutgers University (Asst. Professor, St. Thomas Aquinas College, NJ)

Julie Monet, 2005. Rutgers University – (Asst. Professor, UC- Chico, CA)

Jiun-Ling Ke, 2004, King's College London, Co-chair, (Physics Teacher, Taiwan)
 Sonja Monk, 2003, University of Oslo – **Disputer**
 Kirsten Ellenbogen, 2002, Vanderbilt University (Executive Director/President Great Lakes Science Center, Cleveland, OH)
 Stein Danker Klosto, University of Oslo – **Disputer**
 Anthony Petrosino, 2000, Vanderbilt University, Co-chair, (Associate Professor, University of Texas- Austin)
 Sibel Erduran, 1999, Vanderbilt University (Professor, University of Lim)
 Mike Smith, 1995, University of Pittsburgh (Director Education, American Geosciences Institute; Middle School Teacher, Cleveland, OH)
 Terry Contant, 1987, University of Houston (Science Education Consultant, State of Connecticut)
 Jeffrey Bloom, 1987, University of Houston (Professor, Northern Arizona U.)
 Marla Stone, 1986, University of Houston (International Science Education Consultant)

Post Doctoral Fellows:

- Sofia Kesidou - University of Pittsburgh, (PhD. University of Kiel - Inst. for Science Education) 1990-1992.
- Lucy Avraamidou – King’s College London, (Ph.D. Penn State University) 2002-2004.
- Seunggho Maeng – Penn State University, (Ph.D. National University of Korea) 2009-2011.

Visiting Scholars:

- Maria Pilar Jimenez Aleixandre, Professor of Science Education, University of Santiago de Compostela; at Vanderbilt 1997; at Penn State 2013
- Jazlin Ebenezer, Associate Professor of Science Education, Wayne State University; at Vanderbilt University 1999.
- Sanna Jarvela, Professor, University of Oulu; at King’s College London, 2003.

Program Reviews:

- Rice University, Houston, TX, Member University review of Program in Science Education
- Texas A&M, College Station, TX, Chair, University review of Department of Teaching, Learning and Culture, College of Education.
- Leibniz University-Hannover, Germany. Didactics Programs in Physics, Chemistry, Biology, Mathematics, Geography, Vocational Education

Top Twenty-five Citation Index Publications (# as of 7/5/13 using Google Scholar)

1. Duschl, R. (1990). *Restructuring science education: The role of theories and their importance*. New York: Teachers' College Press. (651)
2. Duschl, R., Schweingruber, H., & Shouse, A., (Eds.), (2007). *Taking Science to School: Learning and Teaching Science in Grades K-8*. Washington, DC: National Academies Press. (590)
3. Jimenez-Aleixandre, M.; Rodriguez, A. & Duschl, R. (2000). "Doing the lesson" or "Doing Science": Argument in High School Genetics. *Science Education*, 84, 757-792. (487)
4. Duschl, R. & Osborne, J. (2002). Supporting and promoting argumentation discourse in science education. *Studies in Science Education*, 38, 39-72. (371)
5. Duschl, R. & Gitomer, D. (1991). Epistemological Perspectives on Conceptual Change: Implications for Educational Practice. *Journal of Research in Science Teaching*, 28(9), 839-858. (321)
6. Duschl, R. & Wright, E. (1989). A Case Study of High School Teachers' Decision Making Models for Planning and Teaching Science. *Journal of Research in Science Teaching*, 26(6), 467-501. (211)
7. Schauble, L., Glaser, R., Duschl, R. Schulze, S. & John, J. (1995). Students' understanding of the objectives and procedures of experimentation in the science classroom. *The Journal of the Learning Sciences*, 4(2), 131-166. (207)
8. Duschl, R. (1994). Research on the History and Philosophy of Science. In D. Gable, Ed., *Handbook of Research in Science Teaching*. New York: Macmillan. pp. 443-65. (179)
9. Duschl, R. & Gitomer, D. (1997). Strategies and challenges to changing the focus of assessment and instruction in science classrooms. *Educational Assessment*, 4, (1), 37-73. (161)
10. Duschl, R. (1988). Abandoning the scientific legacy of science education. *Science Education*, 72(1), 51-62. (153)
11. Duschl, R. (2008). Science education in 3 part harmony: Balancing conceptual, epistemic and social learning goals. *Review of Research in Education*, V32. 268-291. (144)
12. Duschl, R. (1985). Science education and philosophy of science: Twenty-five years of mutually exclusive development. *School Science and Mathematics*, 85(7), 541-555. (143)
13. Duschl, R. (1997). *Renovar La Enseñanza de las Ciencias*. (Spanish Translation *Restructuring Science Education: The Importance of Theories and Their Development* by Victor Alvarez Perez y M.Pilar Jimenez Aleixandre) Madrid: Narcea, S.A. De Ediciones. (141)
14. Duschl, R. (2000). Making the nature of science explicit. In R. Millar, J. Leech & J. Osborne (Eds.) *Improving Science Education: The contribution of research*, Philadelphia: Open University Press. pp 187-206. (128)
15. Duschl, R., Hamilton, R. & Grandy, R. (1990). Psychology and epistemology: Match or mismatch when applied to science education? *International Journal of Science Education*, 12(3), 230-243. (78)
16. Duschl, R. (2003). Assessment of Inquiry. In M. Atkin & J. Coffey Eds., *Everyday Assessment in Science Classrooms*. Washington, DC: NSTA Press. (73)

17. Duschl, R. (2007). Quality argumentation and epistemic criteria. In S. Erduran & M. Jimenez-Aleixandre, Eds. *Argumentation in Science Education: Perspectives from classroom-based research*. Dordrecht Netherlands: Springer. (67)
18. Grandy, R. & Duschl, R. (2007). Reconsidering the Character and Role of Inquiry in School Science: Analysis of a Conference. *Science & Education*, 16(1). (56)
19. Duschl, R. (1983). The elementary-level science methods course: Breeding grounds for an apprehension toward science? *Journal of Research in Science Teaching*, 20(8), 745-754. (55)
20. Duschl, R. & Grandy, R. (Eds.) (2007) *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers. (53)
21. Erduran, S. & Duschl, R. (2004). Interdisciplinary characterizations of models and the natural chemical knowledge in the classroom. *Studies in Science Education*, 40, 111-144. (52)
22. Duschl, R. & Grandy, R. (2008). Reconsidering the character and role of inquiry in school science: Framing the debates. In R. Duschl & R. Grandy, Eds., *Teaching Scientific Inquiry: Recommendations for Research and Implementation*. Rotterdam, Netherlands: Sense Publishers. (48)
23. Osborne, J. F., Duschl, R., & Fairbrother, R. (2002). *Breaking the Mould: Teaching Science for Public Understanding*. Nuffield Foundation. (47)
24. Duschl, R. & Hamilton, R. (Eds.) (1992). *Philosophy of Science, Cognitive Psychology, and Educational Theory and Practice*. Albany, NY: SUNY Press. (46)
25. Lythcott, J. & Duschl, R. (1990). Qualitative research: From method to conclusions. *Science Education*, 74, 445-460. (43)