**ROSEMARY S. RUSS**

School of Education, Department of Curriculum and Instruction

University of Wisconsin, Madison

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**EDUCATION**

**University of Maryland College Park, MD**

*Ph.D., Physics, 2006*

* Dissertation: A framework for recognizing mechanistic reasoning in student scientific inquiry
* Advisor: Professor David Hammer, Cognition & Instruction and Physics
* Committee Members: Edward F. Redish, Physics; Rachel E. Scherr, Physics; Robert Dorfman, Physics; Lindley Darden, Philosophy

**North Carolina State University** **Raleigh, NC**

*B.S., Physics, 2002,* summa cum laude

*B.S., Applied Mathematics, 2002,* summa cum laude

*B.S., Statistics, 2002,* summa cum laude

**APPOINTMENTS**

**University of Wisconsin - Madison, School of Education Madison, WI**

*Assistant Professor of Science Education, Department of Curriculum and Instruction, Aug 2012 - Present*

**Northwestern University, School of Education and Social Policy Evanston, IL**

 *Research Assistant Professor, Learning Sciences Program, Feb 2009 – Aug 2012*

*Postdoctoral Fellow, Learning Sciences Program, Jan 2007 – Jan 2009*

**University of Maryland College Park, MD**

*Research Assistant, Physics & Science Education Research Groups, Aug 2003 – Dec 2007*

**RESEARCH INTERESTS**

Student intuitive science knowledge, teacher noticing, student and teacher cognition, epistemology, scientific reasoning and explanation, Discourse and Conversation Analysis, clinical interviews, qualitative methods, theory development, philosophy of science

**TEACHING INTERESTS**

Science methods (elementary and secondary), conceptual change/intuitive science knowledge, knowledge representations, epistemology and nature of science, explanation, interview methodology, Discourse and Conversation Analysis, use of video in teacher education

**RESEARCH EXPERIENCE**

### Northwestern University, Learning Sciences Program Evanston, IL

*Research Assistant Professor, “Developing Innovative Video Club Designs for Teacher Learning” (Arthur Vining Davis Foundations), Jan 2011 – Present*

*PI, Miriam Gamoran Sherin; co-PIs, Rosemary S. Russ & Penelope Petersen*

Design video-based professional development materials to tune middle and high school teacher attention to the substance of their students’ algebraic thinking. Implement and evaluate the materials with pilot groups of teachers.

*Research Assistant Professor, “Examining Discourse Interactions in Clinical Interviews about Students’ Intuitive Science Knowledge” (National Academy of Education/Spencer Foundation), Aug 2010 – Present*

*PI, Rosemary S. Russ*

Design and collect clinical interviews, peer collaboration sessions, and tutoring sessions with high school and undergraduate students about science. Use constructs of Conversation Analysis to examine how discourse and reasoning compare across these interactions.

*Research Assistant Professor, “Freezing Time: Using digital video to help teachers reason about classroom events” (Edison Foundation), Jan 2009 – Present*

*PIs, Miriam Gamoran Sherin & Bruce Sherin*

Implement new video technology to study teacher attention in high school science and math classrooms. Design and conduct interviews to probe middle school students’ knowledge of science and math topics. Develop and implement professional development for science and math teachers around the interviews.

*Postdoctoral Fellow, “Center for Learning and Teaching with a Focus on Research for Developing Instructional Materials in Science” (National Science Foundation), Jan 2007 – Dec 2008*

*PI, Jo Ellen Roseman; co-PIs, E. Smith, B. Reiser, J. Krajcik, G. DoBoer, & J. Gallagher*

Analyze video data from clinical interviews to identify dynamic elements of student cognition during reasoning and model the impact of interviewer discourse moves on reasoning. Use content area expertise to consult on various curriculum, professional development, and graduate research projects.

### University of Maryland, Department of Physics College Park, MD

Research Assistant, “Toward a New Conceptualization of What Constitutes Progress in Learning Physics, K-16: Resources, frames, and networks” (National Science Foundation), May 2005 – Dec 2006

PI, David M. Hammer; co-PIs, Edward Redish, Andrew Elby, Uri Wilensky, & Rachel Scherr

Analyze video data to identify continuities in knowledge and reasoning between K-12 students and professional scientists. Develop a framework to reliably identify students’ mechanistic reasoning and epistemology. Examine the role of instructors and peers in college small group interactions.

**University of Maryland, Department of Education: Curriculum & Instruction College Park, MD**

Research Assistant, “Case Studies of Elementary Student Inquiry in Physical Science” (National Science Foundation), Aug 2003 – May 2004

PI, David M. Hammer; co-PI, Emily van Zee

Select, analyze, and edit classroom video for professional development materials centered on paying attention to student thinking. Assess and characterize the quality of student discussions based on
non–content-based objectives.

**TEACHING EXPERIENCE**

**Northwestern University, Learning Sciences Program Evanston, IL**

*Instructor, NU-Teach Alternative Certification Program, June 2009 – Present*

Design and lead sessions for elementary and secondary certification programs centered on supporting pre-service teachers’ attention to students’ science and mathematics thinking. Facilitate large and small group discussions around interview and classroom video excerpts.

*Instructor, “Topics in Learning Sciences: Learning Sciences Journal Club,” Aug 2007 – Present*

Conduct a weekly seminar for advanced graduate students designed to support their learning how to read and analyze research articles.

*Co-Instructor, “Topics in Learning Sciences: Methods of Theory Development,” Jan 2007 – Mar 2007*

Plan and facilitate a weekly course for graduate students on the purpose and process of theory development in educational research.

**University of Maryland, Department of Physics College Park, MD**

*Instructor, “Inquiry Into Physics,” Jan 2005 – May 2005*

Teach a non–textbook-based conceptual physics course for Elementary and Early Childhood Education pre-service teachers. Design and facilitate lab investigations with an emphasis on students constructing models and theories for physical phenomena, including circuits, optics, and buoyancy.

#### Workshop Instructor, Summer Girls Program, July 2004

Plan and implement class discussions and student investigations in a two-week program designed to encourage middle school girls to enter the sciences.

Teaching Assistant, “Fundamentals of Physics I and II,” Aug 2002 – Aug 2003

Lead laboratories and discussion sections in a reformed introductory physics sequence for bioscience majors. Evaluate student work on laboratory performance and participation, journals, class homework, and exams.

**University of Maryland, Materials Research Science & Engineering Center College Park, MD**

# Classroom Teacher and Facilitator, Middle and High School Science, Aug 2004 – Dec 2004

 Facilitate learning in middle school science classrooms by leading class discussions, developing, implementing and monitoring labs and demonstrations, grading written work, monitoring science fair progress. Design and teach a course in Modern Physics for high school–aged home-schooled students.

### American Physical Society College Park, MD

# Curriculum Materials Developer, World Year of Physics, Aug 2004

Develop student guides for a nationally distributed, investigation-based curriculum supplement for middle school science students and teachers.

### North Carolina State University, The Science House Raleigh, NC

*Curriculum Materials Developer, Summers 1999 – 2002, June 2004*

Design assessments and sessions for K–12 teacher professional development workshops as part of the North Carolina Partnership for Improving Mathematics and Science. Develop and facilitate K–12 students science outreach programs based in new data collection/storage devices, hands-on demonstrations and investigations, and real-world research.

**PUBLICATIONS**

* Russ, R.S., & Sherin, M.G. (accepted). Using interviews to uncover student ideas in science. *Science Scope*.
* Russ, R.S., & Luna, M.J. (accepted). Merging research traditions: Inferring teacher epistemological framing from local patterns in teacher noticing. *Journal of Research in Science Teaching*.
* Russ, R.S., Lee, V.R., & Sherin, B. (2012). Framing in cognitive clinical interviews: Student understanding of the interview interaction. *Science Education,* 96, 573-599.
* Sherin, M.G, Russ, R.S., & Colestock, A.A. (2011). Accessing Mathematics Teachers’ In-the-Moment Noticing. In M.G. Sherin, V. Jacobs, R. (Eds.), *Mathematics teacher noticing: Seeing through teachers’ eyes* (pp. 79-94). New York: Routledge.
* Russ, R., Sherin, B. L., & Sherin, M. G. (2011). Images of expertise in mathematics teaching. In Y. Li & G. Kaiser (Eds.), *Expertise in mathematics instruction: An international perspective* (pp. 41-60). New York: Springer.
* Sherin, B.L., Sherin, M.G., Colestock, A.A., Russ, R.S., Luna, M.J., Mulligan, M., & Walkoe, J. (2010). Using digital video to investigate teachers’ in-the-moment noticing. In K. Gomez, L. Lyons, & J. Radinsky (Eds.), *Learning in the Disciplines: Proceedings of the 9th International Conference of the Learning Sciences (ICLS 2010) - Volume 2, Short Papers, Symposia, and Selected Abstracts.* International Society of the Learning Sciences: Chicago IL.
* Luna, M.J., Russ, R.S., & Colestock, A.A. (2009). Teacher noticing in-the-moment of instruction: the case of one high-school science teacher. *Proceedings of the 2009 National Association for Research in Science Teaching.*
* Russ, R.S., Coffey, J.E., Hammer, D., & Hutchison, P. (2009). Making classroom assessment more accountable to scientific reasoning: A case for attending to mechanistic thinking. *Science Education,* 93, 875-891.
* Russ, R.S., Scherr, R.E., Hammer, D., & Mikeska, J. (2008). Recognizing mechanistic reasoning in student scientific inquiry: A framework for discourse analysis developed from philosophy of science. *Science Education*, 92, 499-525.
* Russ, R.S., & Sherin, B.L. (2008). Reframing research on intuitive science knowledge. In *Cre8ting a learning world: Proceedings of the Eighth International Conference of the Learning Sciences.*
* Sherin, M.G., Russ, R.S., Sherin, B.L., & Colestock, A. (2008). Professional vision in action: An exploratory study. *Issues in Teacher Education*, 17(2), 27-46.
* Lee, V.R., Russ, R.S., & Sherin, B. (2008). A functional taxonomy of discourse moves for conversation management during cognitive clinical interviews about scientific phenomena. In V. Sloutsky, B. Love, & K. McRae (Eds.), *Proceedings of the 30th Annual Meeting of the Cognitive Science Society* (pp. 1723-1728). Austin, TX.
* Hammer, D., Russ, R., Mikeska, J., & Scherr, R. (2008). Identifying inquiry and conceptualizing students’ abilities. In R.A. Duschl & R.E. Grandy (Eds.), *Teaching Scientific Inquiry: Recommendations for Research and Application* (pp. 138-156). Rotterdam, NL: Sense Publishers.
* Scherr, R.E., Russ, R.S., Bing, T., & Hodges, R.A. (2006). The initiation of student-TA interactions in tutorials. *Physical Review – Special Topics: Physics Education Research*, 2: 020108-020116.
* Russ, R.S., & Hutchison, P. (2006). It’s okay to be wrong: Recognizing mechanistic reasoning during student inquiry. In S.A. Barab, K.E. Hay, & D.T. Hickey (Eds.), *Making a Difference: Proceedings of the Seventh International Conference of the Learning Sciences* (pp. 641-647). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
* Russ, R. (2003). Trick of the Trade: Super Martian Hat. *The Physics Teacher*, 41(6): 368.
* Stallings, R. (August 1999). “Astronomy in the Classroom Resource Links,” <http://www.science-house.org/learn/astro/introduction.html>
* Contributions to “PhysicsQuest: The Search for Einstein’s Missing Treasure,” American Physical Society (2005)

**PRESENTATIONS**

## National Assn for Research in Science Teaching Annual Conference, Apr 2011 Orlando, FL

*Related Paper Set Presider and Presenter:* “Resolving Under-specification: Using teachers’ existing practices to refine the meaning of “attending to student thinking,” R.S. Russ in “Promoting and Examining Teacher Attention to Student Thinking in Science Classrooms,” R.S. Russ, session chair.

## Annual Meeting of the Society for Text and Discourse, Aug 2010 Chicago, IL

 *Paper Presentation:* “Characterizing the Nature of Interviewer Talk in Cognitive Clinical Interview Discourse Interactions,” R.S. Russ, B. Sherin, and V.R. Lee in “Interviews and Surveys,” M. Schober session chair.

## International Conference of the Learning Sciences, June 2010 Chicago, IL

*Paper Presentation:* “Science and Mathematics Teachers’ In-the-Moment Noticing: Attending to Student Thinking within a Lesson and Beyond,” A.A. Colestock and R.S. Russ in “Using Digital Video to Investigate Teachers’ In-the-Moment Noticing,” B. Sherin session chair.

## American Educational Research Association Annual Conference, Apr 2010 Denver, CO

*Poster Presentation:* “Merging two research traditions: Inferring teacher epistemological framing form patterns in teacher noticing,” R.S. Russ and M.J. Luna in “Epistemological Framing: Understanding Shifts in Teachers’ Attention, Behavior, and Epistemological Stances,” A. Elby session chair.

## Foundations & Frontiers in Physics Education Research, Aug 2009 Bar Harbor, ME

*Invited Targeted Session Organizer and Presider:* “Being explicit about the choice and influence of theory in research,” R.S. Russ and N. Podolefsky session chairs.

## American Educational Research Association Annual Conference, Apr 2009 San Diego, CA

*Poster Presentation:* “Understanding the role of the interviewer in cognitive clinical interviews,” R.S. Russ, V.R. Lee, and B.L. Sherin.

*Paper Presentation:* “Framing in cognitive clinical interview: Cues and interpretations,” R.S. Russ, V.R. Lee, and B.L. Sherin in “Epistemological Frames in Students’ Scientific Activity and Reasoning across Formal, Informal, and Research Contexts,” D. Hammer session chair.

*Paper Presentation:* “Professional Vision in action: An exploratory study,” M.G. Sherin, R.S. Russ, B.L. Sherin, and A. Colestock in “Teacher Autonomy in Using Digital video for Professional Learning of Practicing Teachers,” B. Yusko session chair.

## International Conference of the Learning Sciences, June 2008 Utrecht, Netherlands

*Paper Presentation:* “Reframing research on intuitive knowledge,” R.S. Russ and B.L. Sherin.

## American Association of Physics Teachers Winter Meeting, Jan 2008 Baltimore, MD

*Invited Paper Presentation:* “Beyond correctness: Recognizing mechanistic reasoning in student scientific inquiry,” R.S. Russ.

*Presentation*: “Using new video technologies to study teacher noticing,” R.S. Russ, M. Sherin, B. Sherin, A. Colestock, and M. Luna.

## American Association of Physics Teachers Summer Meeting, July 2006 Syracuse, NY

*Paper & Poster Presentation*: “Relationship of mechanistic reasoning and empirical results during student inquiry,” R.S. Russ, D. Hammer, and R.E. Scherr.

## International Conference of the Learning Sciences, June 2006 Bloomington, IN

*Paper presentation:* “It’s okay to be wrong: Recognizing mechanistic reasoning during student inquiry,” R.S. Russ and P. Hutchison.

## National Assn for Research in Science Teaching Conference, Apr 2006 San Francisco, CA

*Paper Presentation:* “Identifying mechanistic reasoning in student inquiry,” R. S. Russ, D. Hammer, and R.E. Scherr.

## Foundations and Frontiers in Physics Education Research, Aug 2005 Bar Harbor, ME

*Poster Presentation:* “Using a mechanistic framework to identify valuable aspects of incorrect student comments in science discussions,” R. Russ, R. E. Scherr, and D. Hammer.

### American Educational Research Assn Annual Conference, Apr 2005 Montreal, Canada

*Poster Presentation:* “Recognizing and distinguishing scientific aspects of first graders’ reasoning about motion,” R. Russ, J. Mikeska, R. E. Scherr, and D. Hammer.

**GRANTS**

**Current**

*Developing a Video Club Curriculum: Supporting Teacher Reflection on Mathematics Learning* (PI, M. Sherin; co-PIs, R.S. Russ and P. Peterson). Arthur Vining Davis Foundations, $200,000, 2011–2012.

**AWARDS AND FELLOWSHIPS**

**Northwestern University Evanston, IL**

* National Academy of Education/Spencer Postdoctoral Fellowship, 2010–2012

**University of Maryland** **College Park, MD**

* NSF Graduate Teaching Fellow, GK-12 Education Program
* Physics Department Graduate Fellowship
* Ruth Davis Fellowship (Outstanding Female Graduate Student)
* 2002–2003 Kapo-Barwick Award (First Year Physics Graduate Student with Highest GPA)

**North Carolina State University** **Raleigh, NC**

* Valedictorian, Class of 2002
* Phi Beta Kappa, Phi Kappa Phi, Sigma Pi Sigma, and Pi Mu Epsilon National Honor Societies
* Senior Scholarly Achievement Awards for the College of Physical and Mathematical Sciences, Department of Statistics, and Department of Physics

**PROFESSIONAL SERVICE AND DEVELOPMENT**

* Reviewer: Science Education, Journal of Research in Science Teaching, Cognition and Instruction, Journal of the Learning Sciences, Discourse Processes, Instructional Science
* Editor: “Knowledge in Pieces” International Research Community newsletter
* Member: American Educational Research Association, International Society of the Learning Sciences, Society for Text and Discourse

**REFERENCES**

* Prof. David Hammer, Department of Education

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* Prof. Miriam Gamoran Sherin, Learning Sciences Program, School of Education & Social Policy

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* Associate Prof. Bruce Sherin, Learning Sciences Program, School of Education & Social Policy

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