About the Contributors

**Drew Polly** is an Associate Professor in the Elementary Education program at the University of North Carolina at Charlotte. His research interests include examining how to best support teachers’ use of learner-centered pedagogies and educational technologies in mathematics teaching.

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**Wendy Rose Aaron** is an assistant professor of Education at Oregon State University and former graduate student and postdoctoral fellow at the University of Michigan. Wendy’s research interests include the work that students do in secondary classrooms, the use of representations of instruction in teacher education and educational research, and the mathematical knowledge required to effectively teach mathematics.

**Sandra Alon** is an Assistant Professor for Teaching Children Mathematics at William Paterson University, College of Education. Alon’s work draws on her many years of experience as a Mathematics classrooms teacher, Mathematics Supervisor, and teacher educator. Her main areas of research are the acquisition and development of mathematical concepts. Dr. Alon received her Ed.D. in Mathematics Education in 1997 from Teachers College, Columbia University.

**Lisa Ames** graduated from Bucknell University in 2007 with a B.A. in Mathematics and a minor in Education. Since then, she has been a middle and high school mathematics teacher at Wood-Ridge High School in Wood-Ridge, New Jersey. Lisa received her M. Ed. in Curriculum and Learning, concentrating in Teaching Children Mathematics in 2011 at William Paterson University.

**Heejung An** is an Associate Professor of Learning Technologies and the Director of the M. Ed in Curriculum and Learning at the College of Education, William Paterson University. Her main areas of research explore how technology impacts cognition and how K-12 teachers can use technology effectively for teaching and learning. Dr. An received her Ed.D. in Instructional Technology and Media in 2004 from Teachers College, Columbia University.

**Kate Best** is a Visiting Assistant Professor of Mathematics Education in the Department of Mathematics and Computer Science at Western Carolina University in Cullowhee, North Carolina. She earned an M.A. in Mathematics from Miami University. She has completed significant doctoral work towards a Ph.D. in Mathematics Education at Portland State University. Her current research interests focus on equity in mathematics education, mathematical agency, and assessment.
Linda Boland has worked for Pearson as the Product/Marketing Manager of *Investigations in Number, Data, and Space* for the past 11 years. She works closely with the TERC authors of Investigations, and the Pearson editors as they develop copyright updates and new editions of the product. She also provides marketing collateral for the account executives who sell the program, and provides product support for the customers who purchase *Investigations*. Ms. Boland has been a publishers’ educational consultant to provide implementation support to customers, and an independent consultant providing teachers’ professional development in math and science in Arizona. She has taught elementary grades, and supported district teachers as a Specialist in Mathematics and Gifted Education. She was awarded the Presidential Award for Excellence in Teaching Elementary Mathematics, Arizona, 1996.

Nathan Borchelt is an Assistant Professor of Mathematics Education in the Department of Mathematics and Computer Science at Western Carolina University in Cullowhee, North Carolina. He holds a M.S.T. in Mathematics from the University of Florida and a Ph.D. in Teaching and Learning: Mathematics Education from Georgia State University. His research interests are focused on the scholarship of teaching and learning, especially with respect to the role of technology as a cognitive tool.

Silvy Brookby is an assistant professor at Framingham State University in Framingham, Massachusetts. She received her bachelor’s degree from Northwestern University, her master’s degree from Stanford University and her doctorate from University of Missouri (Kansas City). She teaches early childhood and elementary mathematics and science methods courses as well as monitoring student teachers. Her research interests center around mathematics teaching and learning as well as mathematics anxiety affiliated with pre-service elementary and early childhood teachers.

Christine A. Browning is a professor of mathematics education in the Department of Mathematics at Western Michigan University based in Kalamazoo, Michigan. She teaches undergraduate and graduate mathematics content courses for K-8 preservice teachers, and undergraduate and graduate mathematics education courses that focus on middle school. Christine is interested in developing mathematics curriculum for preservice elementary/middle school teachers that a) makes appropriate use of digital tools and b) incorporates artifacts of children’s thinking. She is also interested in the use of digital tools that extend the walls of the mathematics classroom and engage preservice teachers with mathematics, teaching and learning. Her research areas of interest are on mathematical content knowledge for teaching K-8, and Technology, Pedagogy, And Content Knowledge (TPACK).

Vu Minh Chieu is a researcher at the School of Education, University of Michigan. Chieu is interested in the research of learning technologies, including multimedia, Web-based learning platforms, simulations, intelligent tutoring systems, and computer-supported collaborative learning, for higher education and professional development.

Jennifer Czocher is an Assistant Professor of Mathematics at Texas State University. She received her doctoral degree in mathematics education from The Ohio State University in 2013 where she also received her master’s degree in mathematics. Her research interests are in students’ mathematical thinking and their development of mathematical modeling skills.
About the Contributors

Alden J. Edson is a doctoral fellow in the Center for the Study of Mathematics Curriculum and a Ph.D. student studying K-12 Mathematics Education at Western Michigan University. He is currently a research assistant with the Core-Plus Mathematics Project and with the Transition to College Mathematics and Statistics Project. AJ is interested in school mathematics curriculum development, the emergence of innovative technologies in mathematics education, the impact of highly interactive digital resources on students’ mathematical learning, and the professional development of mathematics teachers at the secondary school level. His research interests center on the learning and teaching of mathematics in technology-rich environments.

A. Kursat Erbas is an Associate Professor in the Department of Secondary Science and Mathematics Education at Middle East Technical University in Turkey. His research interests include examining the knowledge base for teaching mathematics at the middle and secondary grades and modeling, technology, and problem solving in mathematics education.

Axelle Faughn is an Assistant Professor of Mathematics Education at Western Carolina University, North Carolina. She holds a secondary mathematics teacher certification from France, and a Ph.D. in Computer Algebra from North Carolina State University. Her research focuses on mathematics teacher retention, including opportunities and challenges professional development interventions provide for beginning mathematics teachers. Specific interests include using technology to support the work of secondary mathematics teachers, professional learning communities, and enhancing classroom mathematical inquiry.

Nicole L. Fonger was a doctoral fellow in the Center for the Study of Mathematics Curriculum and earned her PhD in mathematics education at Western Michigan University. For her dissertation research she collaborated with a ninth-grade teacher in investigating algebra students’ change in representational fluency in a computer algebra systems and paper-and-pencil environment. On a broader scale, she is interested in secondary school algebra curriculum development with an emphasis on supporting a meaningful connection between students’ experiences in arithmetic and the study of algebra. An overarching goal of her research agenda is to pursue new ways to link research and practice in secondary school mathematics.

Dana Pomykal Franz is an Associate Professor in Curriculum Instruction and Special Education at Mississippi State University. She teaches both secondary mathematics education methods courses curriculum, instruction, and assessment courses. Her research interests include middle level mathematics education and the implementation of the Common Core State Standards in mathematics. Her public school teaching experience includes over 12 years of high school mathematics, specifically specializing in working with academically at-risk students.

Chris Gordon is the Assistant Director of the Center for Education in Science, Technology, Engineering and Mathematics (CESTEM) at the University of North Carolina Wilmington.

Mary T. Grassetti is an assistant professor of education at Framingham State University in Framingham, Massachusetts. She earned a bachelor of arts in psychology from Mount Holyoke College and a doctorate in education from the University of Massachusetts Amherst. Dr. Grassetti teaches elementary
mathematics and science methods courses and supervises student teachers completing a professional practicum. Her research interests focus on examining the discourse practices novice teachers use to engage students in productive mathematics conversations.

Karen Greenhaus has been a math educator for the past 22 years. In her 17 years in public education, she taught middle school, high school and was a district administrator. She has been involved in professional development for the past 18 years, supporting teacher’s integration of technology and instructional strategies through face-to-face workshops, conference presentations, online courses, and Webinars. Karen is currently completing her doctoral dissertation in Curriculum and Education Technology from the College of William and Mary in Williamsburg, VA, with a projected finish date of May, 2014. She has been in education for the past 23 years, as a teacher, administrator, and professional development provider. Her professional development experience supports teacher’s integration of technology and instructional strategies through face-to-face workshops, conference presentations, online courses and webinars. Karen most recently worked for Key Curriculum as their Director of Education Technology Outreach, and McGraw-Hill Education, as a Senior Product Sponsor for Professional Development. She is currently an independent consultant in edtech professional development.

Karina K. R. Hensberry is a Postdoctoral Research Associate with the PhET Interactive Simulations project, where she contributes to the development of mathematics simulations and conducts research on simulation design and use in middle schools. She earned her PhD in curriculum and instruction (mathematics education) from the University of Florida in 2012. Dr. Hensberry is particularly interested in the role of PhET sims in supporting marginalized students to learn mathematics.

Patricio Herbst is an associate professor of education and mathematics at the University of Michigan. His research interests include mathematics teaching and learning at the secondary and tertiary level, offline and online, teacher thinking and decision-making, teacher knowledge, teacher preparation in mathematics, and the design and use of information technology in education research and practice.

Christian R. Hirsch is Professor and Distinguished Faculty Scholar in the Department of Mathematics at Western Michigan University. His interests include secondary school mathematics curriculum design and development, the impact of innovative curricula on student learning, and the use of innovative curriculum materials as a context for teacher learning. Since 1992, he has directed the Core-Plus Mathematics Project, a high school curriculum development and research project, formerly funded by the National Science Foundation. Christian is also Co-Director of the Center for the Study of Mathematics Curriculum and of the Core Math Tools Project, each supported by the NSF. He presently is Chair of the NCTM Core Tools Task Force. He also currently directs the NSF-funded Transition to College Mathematics and Statistics Project to design, develop, and evaluate the efficacy of a new fourth-year course for non-STEM college-bound students.

Jessica Ivy is a Visiting Assistant Professor at Mississippi State University, where she teaches undergraduate elementary and secondary mathematics methods and general education courses. Her current and recent research interests include instructional technology integration in secondary mathematics classrooms, professional experiences which enhance the quality of secondary mathematics instruction,
and secondary mathematics teachers’ perceptions of their Technological Pedagogical Content Knowledge. Additionally, Jessica is interested in the pursuit of initiatives which form and strengthen partnerships between faculty members of Mississippi institutions of higher learning who have a common goal of improving opportunities for K-12 students in mathematics classrooms, and in projects which consider revisions of pre-service mathematics teacher programs to foster a better development of TPACK prior to beginning classroom experiences.

Kathy M. C. Jaqua is an Associate Professor of Mathematics at Western Carolina University in Cullowhee, NC. She holds a B.S. in Mathematics and English from East Tennessee State University, an M.S. in Mathematics and Mathematics Education from Oregon State University, and a Ph.D. in Mathematics Education from Washington State University. She is director of WCU’s undergraduate program in secondary mathematics education, and her research interests include the sociology of mathematics classrooms and how students become teachers.

Brin A. Keller is an Associate Professor of Mathematics at Michigan State University. Her research interests over the last 20 years have resided at the intersection of mathematics, science, and technology. She was Co-director of the National Council of Teachers of Mathematics (NCTM) Illuminations Project from 2000-2003. Brin’s current work is as a curriculum and software developer for the Core-Plus Mathematics Project and for the Transition to College Mathematics and Statistics Project funded by the National Science Foundation. She also is currently Co-Director of the Core Math Tools Project also funded by NSF and a member of the NCTM Core Tools Task Force.

Dong-Gook (DK) Kim is a faculty member in the School of Business at Dalton State College, Dalton, Georgia. Kim received his Ph.D. degree in Decision Sciences from Georgia State University, Atlanta. He is currently teaching Business Statistics and Quantitative Methods at Dalton State College. His research interests include human decision-making and pedagogical improvement in teaching statistics.

Theodore (TJ) Kopcha is an assistant professor in Learning, Design, and Technology at the University of Georgia. He received his Ph.D. from Arizona State University and has written several papers on teacher professional development. This research was conducted through the support of a research grant from the Office of the Vice President for Research at the University of Georgia.

Sarah Ledford is an Assistant Professor at Kennesaw State University in Georgia. Her research agenda focuses on how to best support secondary mathematics teachers’ use of standards-based pedagogies. She is currently a co-Principal Investigator of the North Metro Mathematics Collaborative project funded by the Georgia Teacher Quality grant program.

Carl Lee earned his BA degree in Mathematics from Yale University with conditional certification to teach secondary math, and his MS and PhD degrees in Applied Mathematics from Cornell University. He joined the Department of Mathematics at the University of Kentucky in 1980, where he is now Professor. He is presently a Chellgren Endowed Professor associated with the University of Kentucky Chellgren Center for Undergraduate Excellence. His research interests include polyhedra, discrete geometry, and mathematics education. He has served as a PI or co-PI for a variety of NSF grants, including a Center
Amy Jensen LeHew is the Elementary Mathematics Specialist for Charlotte-Mecklenburg Schools in Charlotte, NC. LeHew directs, plans, and designs professional development and other projects to support teaching and learning of mathematics in the district’s 104 elementary schools.

Woong Lim is an assistant professor of mathematics education at Kennesaw State University. He is primarily concerned with investigating what teachers learn about teaching and learning and how pre-service teachers develop professional teaching practices. Prior to joining the faculty at Kennesaw State University, Lim taught high school and college mathematics. He studied mathematics at Northwestern University and received his doctorate at the University of Houston.

Jayme Linton is the Director of Teacher Education at Lenoir-Rhyne University in Hickory, North Carolina. Previously, she has held positions as Instructional Technology Facilitator, Staff Development Coordinator, and Instructional Coach for Newton-Conover City Schools. Jayme is a doctoral student in the Teacher Education Ph.D. program at the University of North Carolina at Greensboro. She received a bachelor’s degree in elementary education from Western Carolina University and a master’s degree in curriculum and instruction from Appalachian State University. Jayme is a SimpleK12 Webinar leader and has presented for the Global Education Conference and K-12 Online Conference.

Yating Liu is an assistant professor of mathematics education at Old Dominion University. His research focuses on understanding and enhancing students’ proof and reasoning ability.

Sandra Madden is Assistant Professor of Mathematics Education at the University of Massachusetts Amherst. She pursues several lines of related research including statistics education, by supporting the development and understanding of statistical ideas by secondary teachers and students; mathematics curriculum design and implementation; pre-service and in-service teacher education as evidenced through content knowledge for teaching, beliefs, and practices; and the use of dynamic cognitive tools for teaching and learning. Improving all students’ opportunities to engage with and come to understand powerful mathematical ideas is her ambition.

Robin Magruder earned her doctorate of instruction and administration from the University of Kentucky, where she is a part-time instructor in the STEM department. Her interests include the effective use of manipulatives, both concrete and virtual, in the mathematics classroom. Also, she is interested in developing conceptual understanding on the part of middle school mathematics students. She enjoys sharing knowledge and experiences from over 12 years in the mathematics classroom with preservice and inservice mathematics teachers.

Azita Manouchehri completed her doctorate in mathematics education under the guidance of Dr. James W. Wilson at the University of Georgia. Her scholarly work in the past decade has concentrated on identifying factors that enhance or impede successful implementation of reformed based mathematics.
teaching in classroom settings. More specifically, her research focuses on understanding the anatomy of inquiry-based mathematics instruction and factors that contribute to the development of generative mathematical discourse among learners. Her current research focuses on three interpenetrating domains. Firstly, she is involved in developing research based, pedagogically powerful contexts that successfully engage mathematical inquiry among middle and secondary teachers. Dr. Manouchehri has conducted close to 100 professional development sessions and seminars on various topics including: technology in mathematics, mathematical problem solving, mathematical problem posing, the role and features of inquiry in mathematics classroom, authentic assessment in mathematics for middle, high school, university faculty, and researchers across the country.

Christie Sullivan Martin is an Assistant Professor in Elementary Education at the University of South Carolina. She earned in Ph.D. in 2013 in Curriculum and Instruction with a focus on literacy from the University of North Carolina at Charlotte. Her research agenda focuses on examining the impact of writing across the curriculum and effectively preparing teachers to design these opportunities.

Mahnaz Moallem is a Professor of Instructional Technology and the Coordinator of the Instructional Technology Master’s Degree Program at the University of North Carolina Wilmington.

Margaret Mohr-Schroeder joined the University of Kentucky faculty in 2006 and is currently an associate professor of middle/secondary mathematics education and chair of the secondary mathematics education program. She holds a BSEd and MS in Mathematics from Pittsburg State University (Kansas), and a PhD in Curriculum and Instruction – Mathematics Education from Texas A&M University. As a native of Kansas, she began her career as a junior high, high school, community college, and college mathematics instructor. Since her arrival to UK, Dr. Mohr-Schroeder has been involved in over $13 million in NSF funding, expanding STEM Education through various initiatives including the creation of a STEM Education major, and has been instrumental in garnering internal and external funding to support transdisciplinary teacher preparation. When she is not boating, camping, or using her mathematical abilities to remodel her home, she enjoys researching pre-service teacher Mathematics Education, Mathematics Knowledge for Teaching, and Assessment.

Emily B. Moore is a Postdoctoral Researcher with the PhET Interactive Simulations project. In addition to designing PhET chemistry simulations, Dr. Moore studies the use and effectiveness of PhET simulations in classrooms from elementary to undergraduate levels. She is particularly interested in understanding the role of PhET simulations in supporting effective guided-inquiry learning in group environments.

Shelby P. Morge is an Associate Professor in the Department of Elementary, Middle Level, and Literacy Education at the University of North Carolina Wilmington. She teaches mathematics education courses for pre-service and in-service elementary and middle school teachers. Her research focuses on mathematics-related beliefs, understanding, and assessment. Shelby received her doctorate in mathematics education from Indiana University. She is a former middle school and high school mathematics teacher.
**Sridhar Narayan** is Professor of Computer Science and Department Chair in the Department of Computer Science at the University of North Carolina Wilmington. He received his M.S. and Ph.D. degrees in Computer Science from Clemson University. He also holds an M.S. in Mechanical Engineering from Clemson University, and the B.Tech degree in Mechanical Engineering from the Indian Institute of Technology, Madras, India. Dr. Narayan's research interests are primarily in the area of computational intelligence: neural networks, genetic algorithms, and their applications. He also has an active interest in object-oriented technology, a nascent interest in mobile computing, and he enjoys introducing learners of all ages to the joys of computer programming. He has published research papers in several of these areas and has served as the PI or co-PI on grants exceeding $1.5 million.

**Chandra Orrill** is an Assistant Professor in STEM Education at UMass Dartmouth where she also serves as a Research Associate in the Kaput Center for Research and Innovation in STEM Education. Her research focuses on teacher knowledge and professional development.

**Ariel J. Paul** is a Research Associate with the PhET Interactive Simulations project where he works on designing and studying interactive simulations for middle school math and science. Prior to joining PhET, he earned his PhD in experimental physics from CU-Boulder in 2007 and then worked as a scientific instrument maker in JILA. During his undergraduate, graduate, and subsequent work experience, he kept a constant interest in education; tutoring and teaching at high school, and college levels.

**Katherine K. Perkins** is Director of the PhET Interactive Simulations Project at University of Colorado Boulder (CU). She also directs CU’s Science Education Initiative and serves as a faculty member in Physics. She was trained as an experimental physicist and atmospheric scientist at Harvard University, and transitioned to physics education research in January 2003 as a post-doctoral researcher with Carl Wieman. Since then, her work in science education research has focused on advancing STEM education through several avenues, including work and research on pedagogically-effective design and use of interactive simulations, sustainable course reform, students’ beliefs about science, and institutional change.

**Noah S. Podolefsky** is a research associate with the PhET Interactive Simulations Project and the Physics Education Research Group at University of Colorado Boulder (CU). He earned a PhD in physics at the University of Colorado, Boulder in 2008, with a focus on student use of analogy and representation in learning physics. His current research on interactive simulations examines the nature of learning through play and exploration.

**Diane R. Rogers** is a secondary mathematics teacher and a doctoral student in the Interdisciplinary Ph.D. in Evaluation program at Western Michigan University. She is currently a research fellow for a National Science Foundation funded Assessment for Learning project designed to improve K-12 student assessment practices and preservice teacher education in the Science, Technology, Engineering, and Mathematics (STEM) fields. Diane is interested in building the capacity of pre-service and in-service educators in the areas of assessment for learning, technology integration, databased decision making, and anti-bias education in order to better meet the educational needs of our diverse student bodies.
About the Contributors

D. Craig Schroeder holds dual BS degrees in Physics and Mathematics from Centre College, a MS and PhD in Mathematics Education and an EdS in Educational Leadership from the University of Kentucky. He began teaching high school in Kentucky in 2002 and served as a middle school mathematics coach for a grant project in Fayette County in 2011-2012. He is presently a middle school mathematics and science teacher at Beaumont Middle School and director of the See Blue™ STEM Camp for middle school students. His interests include using technology effectively in the mathematics and science classroom, developing self-regulated learning, and helping students to explore and apply real world STEM concepts in informal learning settings.

Milan Sherman is Assistant Professor of Mathematics Education at Portland State University. He received his EdD in Mathematics Education at the University of Pittsburgh in 2011, and also holds an MS in Mathematics from the University of Pittsburgh (2002). His research interests are in the areas of the teaching and learning of school algebra, and the use of technology the teaching and learning of mathematics at the secondary level. In particular, his research has focused on the influence of instructional technology on students’ mathematical thinking in secondary classrooms. His teaching interests include teacher education courses aimed at supporting teachers in designing and implementing instruction that can support students’ high-level mathematical thinking using technology, and the use of dynamic geometry software to promote conceptual understanding in calculus.

Ravi Somayajulu is an Assistant Professor of Mathematics Education at Eastern Illinois University. He completed his doctoral degree in mathematics education from The Ohio State University in 2012 and a master’s degree in mathematics from Bowling Green State University in 2006. His research interests lie in the area of mathematics teaching and teacher education.

David Stegall is the Associate Superintendent for Newton-Conover City Schools. He previously served Newton-Conover as the Director of Elementary Curriculum, ESL (English as a Second Language) and AIG (Academically and Intellectually Gifted). In February 2012, he was named the Outstanding Young Educator for North Carolina by NCASCD. David joined the Newton-Conover City School system from Iredell-Statesville Schools in July 2007. He has presented at the state, national, and international levels on professional learning communities and teacher empowerment. David received a bachelor’s degree in elementary education from the University of North Carolina at Charlotte; a master’s degree in education from Gardner-Webb University; an education specialist degree in education administration from Appalachian State University; and a doctorate degree in educational leadership from Appalachian State University.

Gene A. Tagliarini, Professor of Computer Science at UNCW, received the BA and MA in Mathematics from the University of South Florida and the PhD in Computer Science from Clemson University. He served as Principal Investigator or Co-PI for Department of Defense, National Science Foundation, Department of Education, and industry grants and contracts in excess of $2M. As an active researcher in the field of biologically inspired computing, he developed neural networks for sonar signal classification, fingerprint matching, image compression, combinatorial optimization, and constraint satisfaction.
He developed a genetic algorithm to design chemical structures, and he has applied wavelet processing techniques, with emphasis upon combining wavelet and neural processing paradigms. Recently, he has engaged in research that uses computing to integrate STEM instruction into 7th-12th grade curricula. Dr. Tagliarini has published over 65 technical papers in the areas of computing for primary education, multimedia software, and biologically inspired computing.

**Jenna Tague** is a doctoral student in mathematics education at The Ohio State University. She received her B.S. Mathematics and M.S. Mathematics from Bucknell University and Colorado State University, respectively. Her research interests include problem solving and mathematical thinking.

**P. Mark Taylor** is a mathematics teacher educator at Carson-Newman University. Dr. Taylor studies inservice and preservice mathematics teacher learning as well as curriculum implementation.

**Keri Duncan Valentine** is a doctoral student at the University of Georgia in the Educational Psychology and Instructional Technology Department within the Learning, Design, and Technology program. Her background as an elementary and middle school mathematics teacher have led her to an interest in designing mathematics learning environments focused on complex geometric and spatial reasoning.

**Pingping Zhang** is a doctoral candidate in mathematics education at the Ohio State University. My research interest lies in the area of epistemology of mathematics. Most specifically, I study individuals’ mathematical thinking processes as exhibited during their engagement in mathematical problem solving, aiming to provide guides for how mathematical thinking might be nurtured and enhanced in instruction. I also examine ways in which knowledge about children’s mathematical thinking might be utilized in courses designed for teachers so to increase their pedagogical and mathematical understandings.