PMET's Park City Workshops Help Re-engage Mathematicians in School Mathematics

Alan Tucker

For the past five summers, groups of research mathematicians interested in school mathematics have met at the Park City Mathematics Institute for three-day workshops including input from teachers and mathematics educators. The first meeting was funded by an individual NSF grant. Subsequent meetings were spart of the MAA's Preparing Mathematicians to Educate Teachers (PMET) program, directed by Alan Tucker and Bernie Madison and also funded by NSF.

Alan Tucker and Roger Howe organized the workshops, focusing first on key mathematical concepts in elementary school (2004, 2005) and then on key concepts in middle school, especially fractions (2006, 2007, 2008). In the first two years, the workshops consisted only of mathematicians, who interacted to some extent with a group of mathematics educators and teachers also meeting at Park City. Each following year an increasing number of mathematics educators and teachers were included. Six working papers have emerged from these workshops; they can be read at the PMET website, http://www.maa.org/pmet. Also there is a detailed summary of the 2007 workshop discussions that highlighted the difficulties that arise when mathematicians and mathematics educators discuss instruction about fractions. The 2008 working paper, *Thinking about Fractions*, shows how these difficulties were resolved.

The primary activity of the PMET grant was running summer workshops for faculty who teach prospective teachers. Each PMET workshop had as guest speakers mathematicians with interesting views about school mathematics. However, workshop participants expressed some frustration that there existed no collective statements by mathematicians comparable to NCTM's *Principles and Standards of School Mathematics*. The Park City workshops were sponsored by PMET in order to produce essays that could serve as first steps at creating such collective statements. The workshop working papers are also meant to be a resource for pre- and in-service professional development for teachers.

Since their publication in 1989, the NCTM *Standards* have served as the basis for most school mathematics standards, curricula, and textbooks, as well as for the accreditation of teacher preparation programs. In initial efforts to reform school mathematics, many mathematicians felt like frustrated bystanders. However, mathematicians are now being asked to play a major role in creating standards and curricula in some states and in national efforts, such as Achieve. Many of the mathematicians involved in such efforts participated in the Park City workshops and are drawing upon the Park City discussions and working papers in their work.

The discussions from which the working papers evolved were as important as the papers. They illustrated the challenges and opportunities that arise when mathematicians with diverse viewpoints try to find common ground among themselves about school mathematics. Discussions between the mathematicians and mathematics educators stimulated as much disagreement between individual mathematicians as between mathematicians and mathematics educators. At the same time, the mathematicians were eager to learn about research by mathematics educators that clarified the sequence of steps by which young children learn key mathematical concepts.

The Park City workshops developed ties with the Common Ground initiative of Richard Schaar, who headed a Business Roundtable task force on the mathematical skills of the workforce. Schaar had been working to end the "Math Wars" in order to focus the energies of all the

"warriors" on improving U.S. school mathematics education. The PCMI workshops and the resulting essays were responsible for much of the groundwork that set the stage for harmonious proceedings at Schaar's 2006 Common Ground conference (funded by a supplement to the PMET grant) and the cordial reception later that year of the NCTM *Curriculum Focal Points* report, a preview of which was the focus of the Common Ground conference.

We believe that the cumulative impact of PMET efforts to give forums to mathematicians to talk and write and discuss school mathematics has gone a long ways towards re-engaging mathematicians in school math instruction. Historically, that long-standing engagement was destroyed with the demise of the 1960s "New Math." While mathematicians were missing in the development of the 1989 NCTM *Standards* and had limited input to the 2000 revision, today they are an integral part of the NCTM *Curriculum Focal Points* initiative, Achieve's American Diploma Project, and similar efforts at the national and state levels.

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North Central Section to Host a "Tope-Notch" Summer Seminar

Jason Douma

What might we expect to find in the interface of classical subject matter and contemporary computational methods? What lies at the intersection of depth and simplicity? How many secrets can a convex polytope reveal in one short week? Participants in the MAA North Central Section's 2009 Summer Seminar will soon find out, as they embark on a tour of combinatorial geometry.

The MAA North Central Section continues its tradition of eclectic biennial summer seminars with this year's upcoming installment, titled ACTUALLY DOING IT! A Hands-On Approach to Computational Combinatorial Geometry. The week-long event will feature as principal lecturer Professor Jesús De Loera from the University of California, Davis.

Professor De Loera will guide participants through this beautiful area of geometry, which deals with geometric structures composed of finitely many elements, including convex polytopes, hyperplane arrangements, and point configurations. Participants will encounter fascinating computational problems that are at once profoundly deep and important, yet beautiful and simple to understand. Sessions will include daily hands-on laboratories using software specifically geared toward these structures.

De Loera's interests in discrete and computational geometry have afforded him regular crossover contact as a member of the graduate groups in both appliedmathematics and computer science at UC Davis. Prior to his current role in the University of California system, Professor De Loera held positions at the Geometry Center at the University of Minnesota, the Swiss Federal Technology Institute, the Mathematical Sciences Institute at Berkeley (where he organized a special semester on Discrete and Computational Geometry), and the Universität Magdeburg in Germany. Dr. De Loera's research has been recognized through an Alexander von Humboldt Award. His excellence in teaching and his service to students have been widely recognized through a number of institutional awards.

The 2009 MAA-NCS Summer Seminar will take place on the picturesque campus of St. John's University in Collegeville, Minnesota, during the week of July 19-24. Affordable on-campus room and board arrangements will be available to participants who are interested in taking in the full retreat experience. Curious mathematical minds from all backgrounds and locations are invited to attend. Additional information, including registration details, may be found at the MAA-NCS Summer Seminar website (http://pages.usiouxfalls.edu/maa/summersem.htm) or by contacting Professor Jennifer Galovich (jgalovich@csbsju.edu) of St. John's University.