



Workshop on Cooperative Group Problem Solving Pedagogy

by Professor Kenneth Heller
Department of Physics
University of Minnesota



When: 10:00-12:00 on Friday, December 7, 2012

Where: 169 Brehm Lab, Wright State University

To register for the workshop, please send an email to Sachiko Tosa at Sachiko.tosa@wright.edu

Space is limited for the first 25 faculty and students who respond
(Lunch provided at 12:00)

Why Cooperative Group Problem Solving

<http://groups.physics.umn.edu/physed/Research/CGPS/CGPSintro.htm>

Students in introductory physics courses typically begin to solve a problem by plunging into the algebraic and numerical solution -- they search for and manipulate equations, plugging numbers into the equations until they find a combination that yields an answer (e.g. the plug-and-chug strategy). They seldom use their conceptual knowledge of physics to qualitatively analyze the problem situation, nor do they systematically plan a solution before they begin numerical and algebraic manipulations of equations. When they arrive at an answer, they are usually satisfied -- they rarely check to see if the answer makes sense.

To help students integrate the conceptual and procedural aspects of problem solving so they could become better problem solvers, Dr. Heller and his group at University of Minnesota developed pedagogy called cooperative group problem solving. In this workshop, Dr. Heller will introduce the pedagogy using some simple physics examples (no physics understanding is necessary) and will address detailed questions of implementing this pedagogy.

Ken Heller is a professor of physics at the University of Minnesota. His current research in high energy physics focuses on the properties of neutrino oscillations. He is helping build the NOvA long baseline experiment to determine the neutrino mass hierarchy and possibly lepton CP violation. Previous work includes the first detection of tau neutrino interactions, the precise measurements of the muon to tau neutrino oscillation with the MINOS experiment, and early proton decay detectors. His work also includes the discovery and investigation of polarization in high energy particle production and the precise measurements of hyperon magnetic moments. His physics education research focuses on understanding student learning of physics through problem solving. His work includes the development of Cooperative Group Problem Solving and curricular tools such as Context-rich Problems and Problem Solving Laboratories. In addition, he has developed systems to support teaching assistants while developing their professional skills. Currently he is developing and testing internet problem solving coaches. He has served as the president of the AAPT and chair of the APS Forum on Education as well as numerous committees in the APS, the AAPT, and the NAS. He received his B.A. from the University of California, Berkeley, Ph.D. from the University of Washington, and was a post-doc at the University of Michigan before joining the faculty of the University of Minnesota where he is College of Science and Engineering Distinguished Professor and Morse-Alumni Distinguished Teaching Professor.

Please also note that Dr. Heller speaks at the colloquium from 3:00-4:00 on Dec 7 in 116 Health Science. The title of the talk is "Building Sustainable Educational Change in Physics – A Systems Approach"

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