GIREP 2008
INTERNATIONAL CONFERENCE
MPTL 13th Workshop

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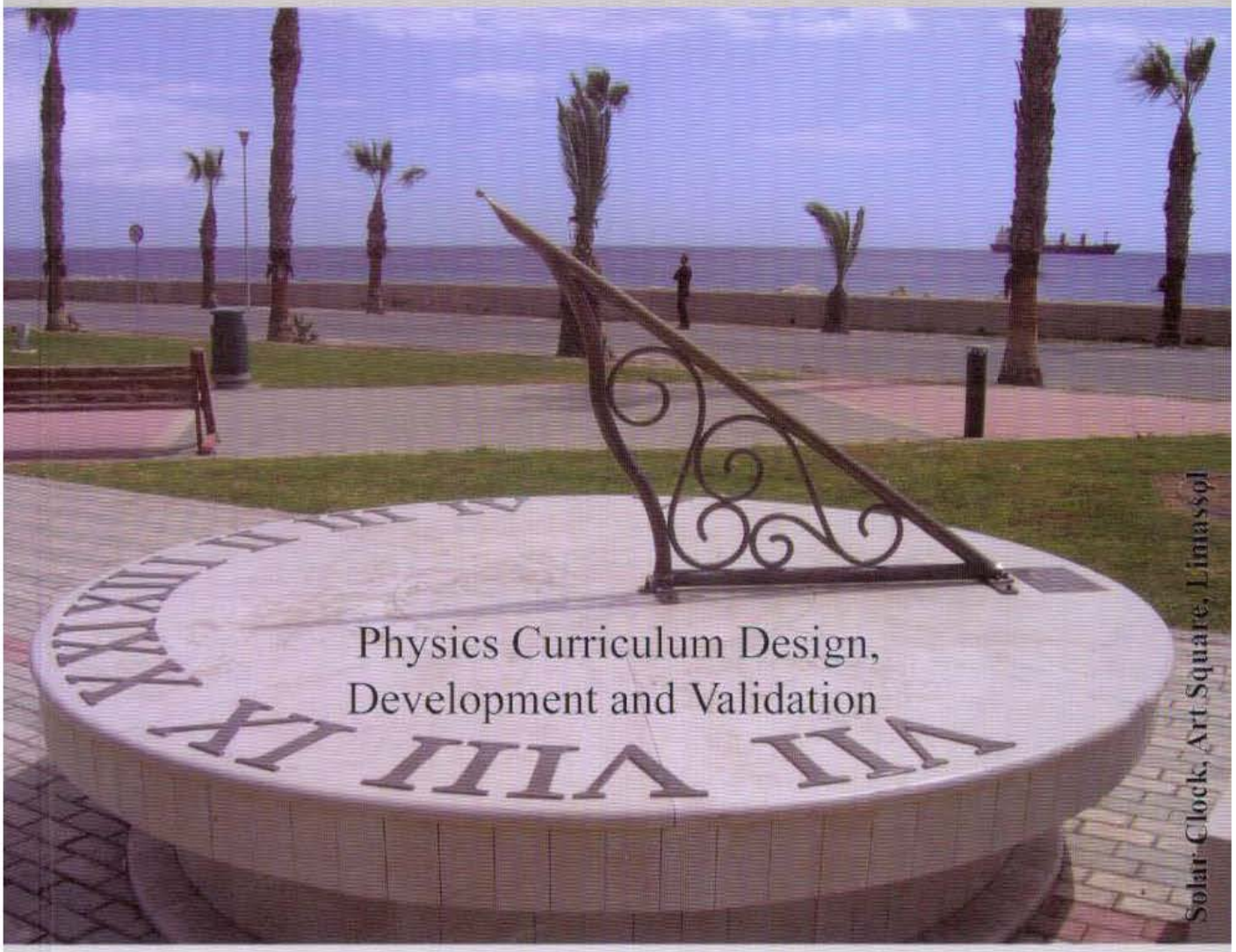
Groupe International de Recherche sur l'Enseignement de la Physique



Solar Clock, Art Square, Limassol

Program and Book of Abstracts

August 18 - 22, 2008, Nicosia, Cyprus

Learning in Science Group

University of Cyprus

emphasize the development of scientific competencies such as structured problem solving. At GW we have developed a 'thinking-skills' curriculum that aims to develop higher-order cognitive processes in students, using a framework based on Marzano's recently completed New Taxonomy of Educational Objectives. Based on a new taxonomy of physics problems being developed by Teodorescu et al. (TIPP: Taxonomy of Introductory Physics Problems) students experience the same physics concept with increasing cognitive complexity across the curricular units, such as reading quizzes, ConcepTests and numerical examples in class, cooperative group problem solving in recitation, lab activities and homework problem solving. This approach allows us to explicitly link physics problems and exercises to the higher-order thinking skills we want the students to develop, thus addressing the common student complaint that the various course elements, such as textbook readings, lecture materials, homework problems and lab exercises, appear disjointed and unrelated to each other. Our framework can easily be adapted to many curricular settings and can be continuously adjusted throughout the semester. We will present preliminary results on improving students' thinking competence, their understanding of physics concepts and their problem-solving proficiency. We will also discuss the pattern of student problem solving behavior that we discovered.

Paper Session 1.6, 13:30 – 14:30 **Room A010**

Building curricula - What to do and what not to do? Examples on electromagnetism from recent polish textbooks

Andrzej Karbowski, Grzegorz Karwasz

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Recent changes in the scholastic system in Poland, i.e cutting the secondary upper school from 4 to 3 years, show how such "reforms" can influence in a non-desired way teaching CVs, in particularly in exact and sequential sciences like Physics. As far as the basis, i.e. Newton's laws remained unchanged, the most dramatic cuts touched more advanced courses, like Electromagnetism. Some textbooks treat this subject in a very formal way, introducing vector algebra and integrals, other are much detailed in graphical explanations. In some books the whole magnetism is treated as a kind of "apparent phenomenon", using Einstein's special relativity theory and shrinkage of electrical charges in movement, with no mentioning magnets, electromagnets, Faraday's induction law and so on. We will try to numerate "the minimum" notions – necessary steps which *can not* be removed if a secondary school CV on electromagnetism should remain a valid didactical unit.