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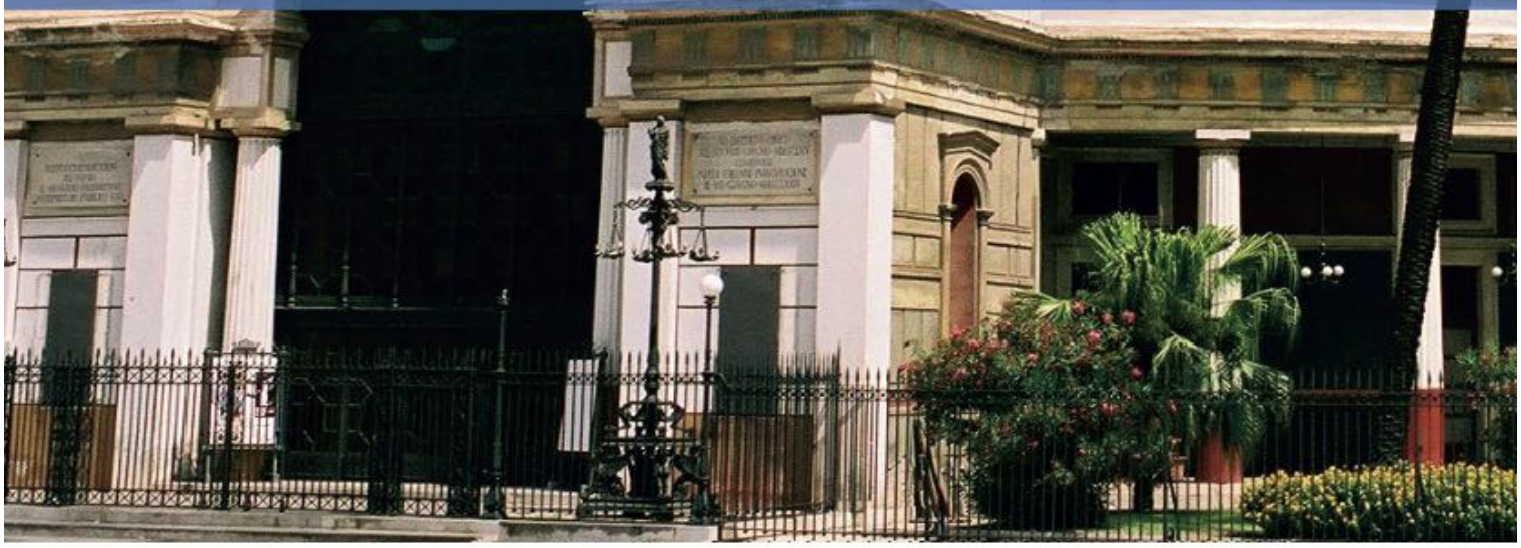
Teaching/Learning Physics: Integrating Research into Practice



PROCEEDINGS OF THE GIREP - MPTL 2014 INTERNATIONAL CONFERENCE

Dipartimento di
Fisica e Chimica

EDITORS
C. Fazio and R.M. Sperandeo Mineo

MPTL
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TEACHING/LEARNING PHYSICS: INTEGRATING RESEARCH INTO PRACTICE

EDITORS

Claudio Fazio and Rosa Maria Sperandeo Mineo

Dipartimento di Fisica e Chimica

Teaching/Learning Physics: Integrating Research into Practice

Proceedings of the GIREP-MPTL 2014 International Conference
held in Palermo, Italy, July 7 - 12, 2014

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The papers included in this volume are a selection of the contribution presented at the Conference. Each paper was reviewed by at least two anonymous referees expert in the field of Physics Education and/or History, Philosophy of Science, Multimedia and ICTs in Physics Education.

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Preface

The GIREP-MPTL International conference on Teaching/Learning Physics: Integrating Research into Practice [GIREP-MPTL 2014] was held . from 7 to 12 July 2014, at the University of Palermo, Italy.

The conference has been organised by the Groupe International de Recherche sur l'Enseignement de la Physique [GIREP] and the Multimedia in Physics Teaching and Learning [MPTL] group and it has been sponsored by the International Commission on Physics Education [ICPE] – Commission 14 of the International Union for Pure and Applied Physics [IUPAP], the European Physical Society – Physics Education Division [EPS-PED], the Latin American Physics Education Network [LAPEN] and the Società Italiana di Fisica [SIF].

The theme of the conference, **Teaching/Learning Physics: Integrating Research into Practice**, underlines aspects of great relevance in contemporary science education. In fact, during the last few years, evidence based Physics Education Research provided results concerning the ways and strategies to improve student conceptual understanding, interest in Physics, epistemological awareness and insights for the construction of a scientific citizenship. However, Physics teaching practice seems resistant to adopting adapting these findings to their own situation and new research based curricula find difficulty in affirming and spread, both at school and university levels. The conference offered an opportunity for in-depth discussions of this apparently wide-spread tension in order to find ways to do better.

The purpose of the GIREP-MPTL 2014 was to bring together people working in physics education research and in physics education at schools from all over the world to allow them to share research results and exchange their experience.

About 300 teachers, educators, and researchers, from all continents and 45 countries have attended the Conference contributing with 177 oral presentations, 15 workshops, 11 symposia, and around 60 poster presentations, together with 11 keynote addresses (general talks).

After the conference, 147 papers have been submitted for the GIREP-MPTL 2014 International Conference proceedings. Each paper has been reviewed by at least two reviewers, from countries that are different to those of the authors and on the basis of criteria described on the Conference web site. Papers were subsequently revised by authors according to reviewers' comments and the accepted papers are reported in this book, divided in 8 Sections on the basis of the keywords suggested by authors. The other book section (actually, the first one) contains the papers that six of the keynote talkers sent for publication in this Proceedings Book.

We would like to thank all the authors that contributed with their papers to the realization of this book and all the referees that with their criticism helped authors to improve the quality of the papers.

Palermo, 30th June 2015 Rosa Maria Sperandeo Mineo and Claudio Fazio