



# Research and Innovation in Physics education



**GIREP-MPTL 2018**

Research and Innovation in Physics education:  
two sides of the same coin

**10.Jul - 11.Jul 2018**

**Cod. Z17-18**

**Mod.:**

Face-to-face

**Edition**

2018

**Activity type**

Summer course

**Date**

10.Jul - 11.Jul 2018

**Location**

Faculty of Engineering, Gipuzkoa

**Languages**

English

**Academic Validity**

20 hours

**Organising Committee**



Fundación  
**BBVA**



## Description

The course will provide participants with the opportunity to fruitfully exchange on their experience and ideas and share the latest information on Physics Education. The course emphasizes both results of physics education research and good practices in teaching physics. The Course strongly encourages practical application of emerging teaching strategies to problems of direct relevance to classroom. Consequently, both theoretical as well as applied physics education topics are of interest.

In accordance with the aforementioned objectives the course includes three different types of activities. "Lectures" on innovations in the teaching of physics based on the results of the research. "Dialogues" wich involves two experts with a leader who gives a brief feedback on the subject and proposes to the two experts questions for the discussion. "Workshops" on two topics of special relevance in the teaching of science: a) laboratory work and use of measurement sensors; b) The professional development of the science teacher.

## Objectives

In accordance with the aforementioned objectives the course includes three different types of activities. "Lectures" on innovations in the teaching of physics based on the results of the research. "Dialogues" wich involves two experts with a leader who gives a brief feedback on the subject and proposes to the two experts questions for the discussion. "Workshops" on two topics of special relevance in the teaching of science: a) laboratory work and use of measurement sensors; b) The professional development of the science teacher.

## Course specific contributors



# Program

## 10-07-2018

09:00 - 10:15 "Lecture: ACTIVE LEARNING STRATEGIES TO IMPROVE STUDENT CONCEPTUAL UNDERSTANDING: SOME CONSIDERATIONS FROM PHYSICS EDUCATION RESEARCH"

**Claudio Fazio**

---

10:15 - 12:00 "Dialogues: "Primary, Secondary and University pre-service physics teacher Education""

**Marisa Michelini**  
**Knut Neumann** -  
**María Gabriela Lorenzo** -

---

12:00 - 14:00 Seminario I (1ª parte) "Research Validated Distance Learning Labs for Introductory Physics Using IOLab"

---

## 11-07-2018

09:00 - 10:15 "Lecture: DIDACTIC RECONSTRUCTIONS AND KNOWLEDGE ORGANIZATION AND CONSOLIDATION IN PHYSICS TEACHER EDUCATION"

**Terhi Mäntylä**

---

10:15 - 12:00 "DIALOGUES: "PRIMARY, SECONDARY AND UNIVERSITY PRE-SERVICE PHYSICS TEACHER EDUCATION""

**Mieke De Cock**  
**Paula R.L. HERON**  
**Jaume Ametller Ametller**

---

12:00 - 14:00 Workshop: PRACTITIONERS INQUIRING IBL IN A LEARNING GROUP AS SUSTAINABLE PROFESSIONAL DEVELOPMENT

---

## Directed by



**Jenaro Guisasola Aranzabal**

UPV/EHU, Física Aplicada I

---

## Teachers



### **Jaume Ametller Ametller**

University of Girona

---

Jaume Ametller is a tenured assistant professor of science education at the University of Girona (Catalonia), where he is the head of the Department of Didactics, and a visiting Fellow at the Centre for the Studies of Science and Maths Education of the University of Leeds (UK). He holds a degree in Physics, an MA in Science and Maths education and a PhD in Science Education from the Autonomous University of Barcelona (Catalonia), has been a post-doctoral researcher (JSPS programme) at the University of Hokkaido (Japan) and a doctoral scholarship (Marie Curie training programme) at the University of Leeds (UK) where he worked from 2003 to 2013 as a research fellow and a lecturer in Science Education. He teaches in undergraduate and post graduate teaching training programmes for primary and secondary education.



### **Mieke De Cock**

---

Mieke De Cock studied Physics at KU Leuven, where she also obtained a PhD in Theoretical Physics (2001). After her PhD, she worked as a medical physicist in the Radiotherapy Department of the University Hospital Brussels. In 2003, she moved part-time to Artevelde University College, as a lecturer in the mathematics teacher training program. At the same time, she worked as a senior teaching assistant at KULAK, the Kortrijk campus of KU Leuven, in the teaching team that implemented the new 'Problem Solving and Design course' in the first year engineering program. In 2007, she was appointed as Assistant Professor in the Physics and Astronomy department in KU Leuven. She is responsible for the Physics Teacher Training Program and started a research group on Physics Education. In 2017, she became Professor.



### **Claudio Fazio**

---

Claudio Fazio has a master degree in Physics and a PhD in Physics Education. He is currently associate professor in Physics Education at University of Palermo, where he teaches Physics Education and

History of Physics. He also teaches in courses for in-service and pre-service Physics teacher education. His current research interests are oriented to: 1) The study of Pupils' Spontaneous Models and Cognitive Resources to improve the effectiveness of pedagogical activities. 2) The development and validation of Active Learning Environments aimed at improving understanding of Physics at Secondary level, as well as at University and Post-Graduate levels. 3) The study of Pedagogical Content Knowledge development in in-service and pre-service Physics teachers. 4) The use of Technologies in Physics teaching and learning in Primary, Secondary, University and Post-Graduate Education. 5) The use of qualitative and quantitative analysis methods to analyze the mental and conceptual models of students



### **Paula R.L. HERON**

---

Paula R.L. Heron is a Professor of Physics at the University of Washington. She holds a B.Sc. and an M.Sc. in physics from the University of Ottawa and a Ph.D. in theoretical physics from Western University. Dr. Heron's research focuses on the development of conceptual understanding and on the development of formal reasoning skills. She has given numerous invited talks on her research at national and international meetings and in university science departments. Dr. Heron is co-Founder and co-Chair of the biannual "Foundations and Frontiers in Physics Education Research" conference series, the premier venue for physics education researchers in North America. She is Chair-Elect of the Executive Committee of the Topical Group on Physics Education Research of the American Physical Society. She co-chaired a joint task force of the APS and AAPT that produced the report Phys21: Preparing Physics Students for 21st Century Careers.



### **María Gabriela Lorenzo**

University of Buenos Aires

---

Pharmacist (1987) of Pharmacy and Biochemistry School of Buenos Aires University, Argentina. PhD of Buenos Aires University (2001). Independent Researcher of National Council of Science & Technology (CONICET). Professor of Health Science Education & Epistemology of University Teacher Education Program (since 2006) and Chair of Research and Support Science Education Centre (since 2005) in Pharmacy and Biochemistry School of Buenos Aires University, Argentina. Representant of Buenos Aires University in UNESCO Chair in Science Education for Latin America and the Caribbean (since 2015). Membership of ESERA European Science Education Research Association, 2009 and vice-president of National Council of Research Groups in Science Education of Argentina (CONGRIDEC). Assessment and reviewer activities of Scientific articles, conference presentations, thesis, research plans, grants, fellowships, among others, for national and international institutions and journals.



**Terhi Mäntylä**

---

Terhi Mäntylä is a university lecturer of science education at the Faculty of Education, the University of Tampere and an adjunct professor of didactic physics at the Tampere University of Technology. She obtained PhD degree in physics (physics education research) from the Department of Physics, University of Helsinki in 2011. In 2011-2012, she was a post doc at the Learning in Science and Mathematics group at the Kristianstad University, Sweden. She has been involved in pre-service physics teacher education since year 2001 in the department of physics and onwards year 2014, in the faculty of education. Terhi has also experience in in-service physics teacher education and in teaching physics and physics education for pre-service elementary teachers. In her research, she has developed instruction methods, especially didactic reconstructions, for pre-service physics teacher education, which aim for better organization and understanding of physics subject matter and concept formation.



**Marisa Michelini**

---



**Knut Neumann**

---

# Registration fees

<b>REGISTRATION</b>	<b>UNTIL 10-07-2018</b>
GENERAL	85,00 EUR
<a href="#">INVITED SPEAKER</a>	0 EUR

# **Place**

## **Faculty of Engineering, Gipuzkoa**

Plaza Europa 1 - 20018 Donostia/San Sebastián

Gipuzkoa