



GIREP Newsletter

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EDITOR'S SECTION

Dear Colleagues,

The electronic GIREP newsletter is issued biannually to inform GIREP active members as well as everybody interested in GIREP activities about ongoing work continued between GIREP seminars and meetings. Since the Summer 2012 all newsletters are available online on the homepage of GIREP website. We announce the publishing of each newsletter by sending an e-mail to all GIREP members and colleagues subscribed at the GIREP mailing list.

On behalf of the GIREP Committee I would like to invite you to contribute to the GIREP Newsletter. There is so much going on in your institutions and your countries. Please inform us about upcoming events, new initiatives and all other announcements that are relevant to GIREP ideas and mission, and you would like to share with the GIREP community.

The deadline for sending information to be included in the next, Autumn issue of this newsletter is September 30th, 2016.

I am looking forward to a fruitful cooperation on the development of the newsletter with GIREP representatives, GIREP members and GIREP friends,

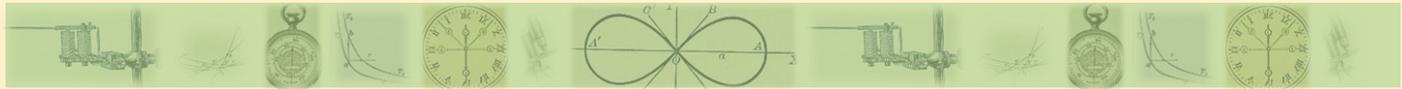
Dagmara Sokołowska

Starting from February 2013 the GIREP newsletter has been recorded permanently as online publication in the ISSN register as follows:

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NEW CO-OPERATIONS WITHIN THE PER & PE COMMUNITY

During GIREP 2015 Conference in Wroclaw Marisa Michelini President of GIREP was successful in concluding further cooperation agreements between GIREP and International Association of Physics Students. The copy of the signed document can be found below:



GIREP COMMITTEE ACTIVITIES

Since the last report in May 2015 the GIREP Committee (GC) took part in six online meetings and one in-person (during the GIREP-EPEC 2015 Conference) were organized.

The work of the GC work has focused on:

- Practical issues of organization of the GIREP-EPEC 2015 Conference in Wroclaw
- GIREP Grand Assembly during the GIREP-EPEC 2015 Conference in Wroclaw
- Organization of the World Conference on Physics Education 2016 in São Paulo (Brazil)
- Proposals for organization of future GIREP seminars and conferences (Krakow 2016, Dublin 2017, San Sebastian 2018)
- Celebration of GIREP 50th Anniversary in 2016
- GIREP Statute legalisation process and the procedure of Statute approval by all GIREP members
- GIREP cooperation with HOPE and other partner organizations
- GIREP representation at Physics and Science Education Conferences: ESERA 2016, MPTL 2016
- Development of GIREP Thematic Groups
- Involvement of GIREP national representatives
- GIREP web site and newsletter

ANNUAL GIREP GENERAL ASSEMBLY 2015

GIREP GENERAL ASSEMBLY 2015 took part on 8th of July, from 4:50 pm till 6:40 pm during the GIREP Conference in Wroclaw. Altogether 42 GIREP members were present, including five members of the GIREP Committee (GC).

The meeting started with voting on approval of GA agenda (33 votes pro, 0 counter voices, 0 abstentions), as well as approval of the minutes of the previous GA meeting in 2014 during GIREP-MPTL Conference in Palermo (33 votes pro, 0 counter voices, 0 abstentions).

Subsequently Marisa Michelini, GIREP President, thanked members of GC for their voluntary work. She continued with describing GIREP policy and GIREP goals in details. She recalled the role of GIREP Thematic Groups, which are formed to gather people sharing similar interest in physics education and research and are anticipated to present their work during each GIREP conference. She mentioned a new initiative Instructional practices in teaching physics at university level launched by Claudia Haagen-Schuetzenhoefer, GIREP Vice-President during the same conference in Wroclaw. Marisa Michelini expressed her wish for GIREP to get involved and cooperate more with other projects, like HOPE (Horizons in Physics Education) Network, in order to promote and develop Physics Education. She mentioned all the bodies GIREP had established close collaboration with, namely: AAPT, APS, CIAEF, EPS-PED, IACPE, iSER, IAPS, LAPEN, MPTL (on the basis of a signed agreement) and ESERA and ICPE (without a signed agreement). She expressed her deep believe in enhancement and development of a good-quality research done in cooperation with above mentioned bodies, as well as by organization of well-prepared GIREP conferences and reinvented seminars where place would be given to in-depth discussions about Physics Education and research in this field. The GIREP President mentioned initiatives of the organization that were continuously sustained, like cooperation with GIREP national representatives, publishing GIREP newsletter, recovering GIREP medal, publishing Proceedings from GIREP conferences and seminars (printed and in online version). She informed the GA about invitation of cooperation received from Springer and its initiative to become a publisher of GIREP. She also mentioned a great role of promoting establishing GIREP legal entity in its future initiatives and cooperation with other legal bodies.

The President's speech was followed by annual report presented by GIREP General Secretary, Dagmara Sokołowska and the Financial Annual Report shown by GIREP Treasurer, Leos Dvořák and approved by the GA (33 votes pro, 0 counter voices, 0 abstentions). Subsequently, Wim Peeters, GIREP Vice-President presented the final version of GIREP Statute and explained further procedure of GIREP legalisation. The Statute was voted for approval (33 votes pro, 0 counter voices, 9 abstentions). Finally Dagmara Sokołowska, organizer of GIREP Seminar 2016 in Krakow, Poland and Eilish McLoughlin, organizer of the GIREP Conference 2017 in Dublin, Ireland invited the audience to the future GIREP meetings and distributed flyers.

At the end of the GA three letters addressed to GIREP President were read:

- First sent by Julia Salinas, President of CIAEF-IACPE Council "greeting with satisfaction and enthusiasm this new GIREP congress" and expressing "warmest greetings and best wishes for academic success, fraternal camaraderie and general welfare to the organizing committee and participants in 2015 GIREP-EPEC conference"
- Second sent by Fatih Taşar, iSER President, assuring maintenance of collaboration between iSER and GIREP and making some announcements about the impact factor of 1.016 assigned to The EURASIA Journal of Mathematics, Science & Technology Education and about 7th year anniversary of publishing another iSER journal, Eurasian Journal of Physics and Chemistry Education. At the end of his letter, the sender wished all the participants "a successful and fruitful GIREP 2015 conference"
- Third letter sent by Maria-José de Almeida from University of Coimbra, Portugal raising the problem of Didactics of Physics "lying on a broad frontier in between the two: Physics research and Science Education, and having practically little chance for financing the projects and scholarships and for publishing the results of research in the field due to lack of understanding or even lack of competences of the reviewers."

The third letter was discussed in details and some constructive advice was given, among others the voice of Prof. Jozef Trna, suggesting appointment of special issues devoted to physics education and research in the field, arranged in good educational journals. The GA confirmed that the problem put forward by the third letter is shared by many countries across Europe.



Participants of GIREP-EPEC 2015 Conference in Wroclaw

GIREP THEMATIC GROUPS (GTG)

GIREP Thematic Groups (GTG) are focused communities of GIREP members interested in sharing their expertise in particular facets of physics education, from working with children, through undergraduate work, to teacher training. The aim of the GTG is to stay in touch as critical friends, exchanging thoughts, materials, and findings from the varied contexts in which we work and contribute to GIREP activities on the topic of GTG. The leader of a GTG takes responsibility for involving and organising the participation of active colleagues in the GTG in the conferences: offering an activity (workshop or poster-symposium, symposium) in each Conference or Seminar of GIREP. GTGs come into existence when someone offers to run one, and writes to the GIREP Committee. If the negotiations go well the GTG is announced in the newsletter.

GTG on Energy

- Group Leader: Paula Heron (University of Washington, USA)
- Contact: pheron@phys.washington.edu

GTG Mathematics in Physics Education

- Group Leader: Gesche Pospiech (Technical University of Dresden, Germany)
- Contact: gesche.pospiech@tu-dresden.de

Physics Education Research at University (PERU)

- Group Leader: Jenaro Guisasola (University of the Basque Country, Spain)
- Contact: jenaro.guisasola@ehu.es

Evaluation of Learning and Instruction (ELI)

- Group Leader: Genaro Zavala, Tecnológico de Monterrey, Mexico
- Contact: genaro.zavala@itesm.mx

Physics Preparation of Teachers in Grades K-6

- Group Leader: Stamatis Vokos, Seattle Pacific University, USA
- Contact: vokos@spu.edu

Problem Solving in Physics Textbooks

- Group Leader: Josip Slisko, Facultad de Ciencias Físico Matemáticas, Benemérita Universidad Autónoma de Puebla, Puebla, México
- Contact: jslisko@fcfm.buap.mx

GIREP THEMATIC GROUPS REPORTS ON RECENT ACTIVITIES

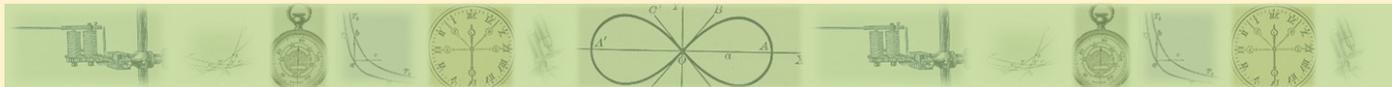
GTG Mathematics in Physics Education

During the last GIREP Conference in Wroclaw the GTG Mathematics in Physics Education held a symposium about different aspects of teaching mathematics and its role in physics. It focused on students' attitudes and their influence on learning on university level (Ileana Greca), analysis of patterns teachers use in classroom in order to provide the students with insight into the interplay of mathematics and physics (Yaron Lehavi et al) and a model for developing and analyzing modelling tasks as well as teaching strategies concerning math in physics (Pospiech et al). Here we found in the overall discussion that a good stage is reached for gathering and presenting the state of research to a wider public. Therefore the next step is to prepare a suitable publication such that more people get access to our work.

On the WCPE in Sao Paulo a workshop will be held in order to get a step forward towards development of educational materials for teachers and materials for use in the classroom.

We invite all people interested in the topic to contribute and join us.

Gesche Pospiech



GTG PHYSICS EDUCATION RESEARCH AT UNIVERSITY (PERU)

Dear Colleagues,

As a faculty Physics teacher at a University level, you face many challenges daily- whether it's keeping students motivated, staying on top of new technologies and discoveries, or finding time to connect with other faculty members. The **GTG Physics Education Research at University** recognizes these challenges and proposes to present to GIREP members high quality studies and overviews that synthesize empirical studies, examine to what extent the research influences undergraduate instruction and show the knowledge and practical products that are necessary for developing physics instruction. We are preparing the following actions to the next to GIREP Conferences, as opportunities for you to learn and network with other College and University teachers, as well as other physics educators.

1.- 2ND WCPE-SAO PAULO

Symposium: **Research-based Alternatives to Traditional Physics Teaching at University.**

Research on physics education clearly indicates that traditional, transmission of well organised sequences of concepts and theories from each chapter is not useful and may actually hinder students' learning of important physics concepts. The research also raises questions about the efficacy of such lecturer methodology for helping students develop their learning. In light of these results the question is: What alternative tasks can we use to help students develop a conceptual understanding? This symposium will present some studies on research-based teaching experiences and its evaluation regarding students' learning.

We are in contact with some groups from America and from Europe to present an international overview of innovative teaching experiences (two from America and two from Europe). Now the symposium is under development and any suggestion for participating are welcome.

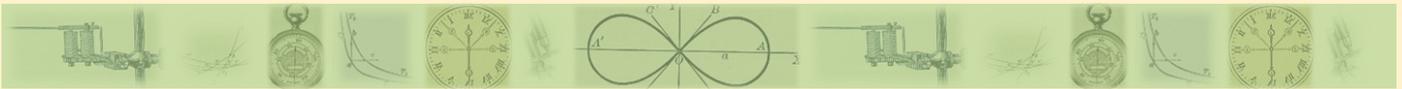
2.- GIREP 2016-KRAKOW

Seminar topic: Teaching and learning Electricity and Astronomy at University. New approaches

In the workshop we will discuss the impact of physics education research on the educational design and practice of physics teaching in Electromagnetism and Astronomy topics at introductory physics courses at university. The presentations and discussion sessions will showcase studies of students' difficulties and teaching problems. Topics related to interface of mathematics and physics will be welcome and how students' mathematical equations involving the meaning of the physics concepts can be developed.

More proposals for Seminar topics at university level are always welcome.

Jenaro Guisasola



INSTRUCTIONAL PRACTICES IN TEACHING PHYSICS AT UNIVERSITY LEVEL

Summary of the kick-off meeting at GIREP-EPEC Conference Wroclaw, 8th July, 2015

This initiative by GIREP focuses on the quality of teaching physics at university level and its improvement. The **situation across most European countries** is characterized by a **lack of people taking up studies in physics** and high **drop-out rates**. **Spectacular outreach activities**, which have been undertaken to improve this situation in the past, **do not turn out to be successful** for several reasons.

It is difficult to give a full, big picture of the current situation at universities, since **comparable data are hard to find**. However, some common themes can be identified: Girls are much less likely to choose physics, there are large regional differences; differences in educational structures can have a large effect on choosing physics.

In order to improve this situation, **students need to be attracted**. Students need to perceive studying physics as a serious option for them. **Studying physics needs to turn into a do-able, enjoy-able, understand-able endeavour from potential and actual students' points of view**. During primary and high school it is necessary to support students in developing a **positive self-concept of them in connection which physics** and science.

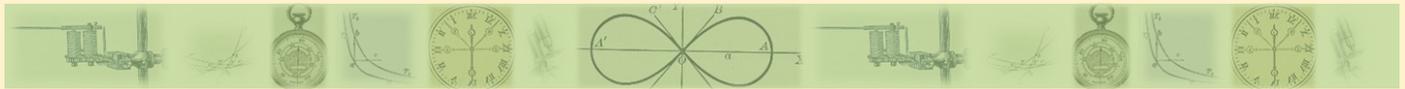
The aim of this GIREP initiative is to gather a critical mass of supporters among the GIREP community as well as evidence from research and best practice examples in the field of successful instructional practices in teaching physics at university level. A kick-off meeting for this initiative was held at the GIREP-EPEC 2015 conference in Wroclaw on July, 8th. Fourteen colleagues joined this meeting.

In a first phase the problems concerning teaching physics at university level were identified:

- Bologna Structure
- Class sizes
- Access to technology
- Personality of the teacher
 - ✓ Background / role of the teacher: researcher vs. not connected to research in science
 - ✓ Motivation for teaching: nasty obligation vs. joyful activity
 - ✓ Teaching philosophy
- Heterogeneous audience with different aims / expectations
 - ✓ Physics majors
 - ✓ Physics teachers
 - ✓ Physics for students of other studies („service teaching“)
- Teaching is not prestigious compared to research
- (Non)Existence of benchmarks on a national / international level (harmonization of learning outcomes)
- Ways of teaching
 - ✓ Teaching (at physics faculties) is in many cases rather like preaching
 - ✓ Students do not get activated
 - ✓ Knowledge is tried to be transmitted not constructed

As a second point effective instructional practices for teaching physics at the university level were discussed and collected. A first general conclusion was, that it is not enough to just list methods, but **only methods put successfully into practice can serve as model to improve the situation**. So, best practice examples need to be collected and spread.

The issue of **dissemination** was discussed next. The participants of the kick-off meeting shared the experience that traditional dissemination (e.g. sending email to advertise a webpage, having meetings at conferences, etc.) does not



work especially as members of our community who are attending conferences like GIREP are aware of the issue of instructional practices and its importance anyway. So our **target group** is more or less **scientists teaching physics at university level for students enrolled in different branches of studies** who are not aware of the importance of appropriate instructional strategies or who have not reflected upon this issue or have not come across innovative instructional strategies so far.

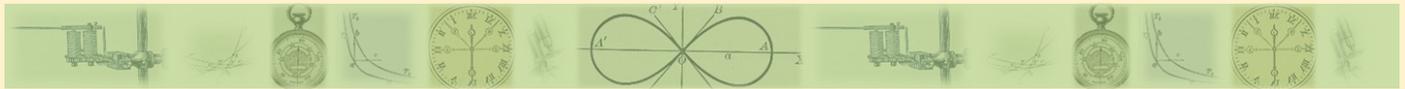
So our **main goal** must be to **get this target group in touch with best practice examples** (<https://www.physport.org/>) and inspire them to a change in their teaching philosophy. What was also stressed was the strategy to go bring more university level teachers to conferences like GIREP to make them experience a different access to teaching and instruction. Outstanding examples of best practice were mentioned: **Paradigms in Physics** - Physics at Oregon State University (<http://physics.oregonstate.edu/paradigms/index>), **SCALE-UP** - North Carolina State University (<http://www.ncsu.edu/per/scaleup.html>)

As **determining factors for chaining the culture of traditional instruction**, which frequently only concentrates on the content to be transmitted but often neglects the needs of the learners, were identified:

- a) **Well chosen “implementation of innovative technology”** (e.g. clickers, simulations & virtual reality labs, ...)
- b) **Instructional formats which cognitively active students without producing cognitive load** (active teaching/learning, problem based learning, peer instruction (focus on communication), ...)
- c) **Appropriate assessment strategies:** In some systems testing (number of tests!) seems to be overdone. In addition, the forms of testing do frequently not correspond to the form of instruction. Students are hardly provided with appropriate, constructive feedback that allows them to align their learning processes. Additionally, assessment results are rarely perceived as signposts guiding the redesign of learning environments provided by university teachers (formative assessment).
- d) **Organisational measures** (appropriate time tables and course sequencing, considering the transition phase from school to university, reflecting the role of maths in learning physics (What to begin with? calculus, non-calculus, application, ...))

For the **long-term perspective of this initiative** a number of **important strategies** were collected:

- Recognise good teaching:
 - ✓ create an award for university teachers who are NOT into education and “advertise” (create role models)
- Create opportunities to engage university teachers in good practice:
 - ✓ Start co-operations between science / physics faculties and education faculties (better on a personal level than on an organizational one)
 - ✓ Start a network for faculties
- Create opportunities to get university teachers into touch with the idea of instructional practices improving learning outcomes
 - ✓ Bring faculty colleagues who are not involved in education to conferences
 - ✓ Set up electronic conferences
 - ✓ Set up conversation platforms like a Facebook group
- Lobbying
 - ✓ Find stake-holders and partners for collaboration
 - ✓ Identify good and efficient ways of dissemination
- Define the status quo: literature research electronic questionnaires?



As possible **short-term initiatives** within this group we collected:

- Advertising this group in the next GIREP newsletter and inviting more colleagues to join us
- Publish a thematic GIREP Newsletter “special issue on instructional practices in teaching physics at university level”:
 - ✓ outlining the status quo of instructional practices at university level
 - ✓ giving a short over-view of research results in this field
 - ✓ finding colleagues who can provide a good practice example from their faculty / university (not only concerning instructional practices but also on organisational issues and on strategies how to get in touch and set-up)
- Collect and republish a collection of best practice papers in this field of previous GIREP conferences
- Identify and win experts/researchers in this field
- Organizing a poster-symposium at the next GIREP conference 2017

I would like to **thank all the colleagues who have participated in this keck-off meeting in Wroclaw**, thank you a lot for your time and your rich and important contributions. For all GIREP members and people interested in this issue, we invite you to join our initiative and **support the endeavour to help to change instructional practices in teaching physics at university level for the better**.

Please contact me: claudia.haagen@uni-graz.at

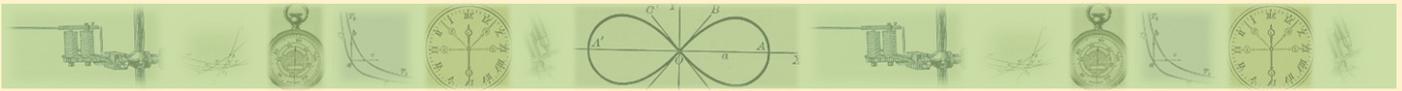
Claudia Haagen-Schuetzenhoefer

GIREP STATUTE

During the GIREP General Assembly in Wroclaw we announced the final version of GIREP Statute that was approved by the GA. GIREP Association will be registered in March in Belgium where relevant procedures seem to be the most easy and also the cheapest.

Thank you for your collaboration and engagement!

Wim Peeters, GIREP Vice-President



WORLD CONFERENCE ON PHYSICS EDUCATION 2016 IN SAO PAULO, BRAZIL

Contemporary Science Education and Challenges in the Present Society: perspectives in Physics Teaching and Learning.

We are looking forward to seeing physics educators, teachers, researchers, and policy makers from around the world at this second World Conference on Physics Education to be held in São Paulo in July 2016. The conference was initiated by Groupe International de Recherche sur l'Enseignement de la Physique (GIREP) and the International Commission on Physics Education (ICPE) – Commission 14 of the International Union for Pure and Applied Physics (IUPAP). It is being sponsored by GIREP, ICPE and the Multimedia in Physics Teaching and Learning (MPTL) group and endorsed by American Association of Physics Teachers (AAPT), Latin American Physics Education Network (LAPEN) and the Asian Physics Education Network (AsPEN).



The vision for the 2016 World Conference on Physics Education is to follow a global participative process before, during and after the conference. The Conference will be structured to help foster collaborations on physics education research and development which can transcend national boundaries.

The goal will be reached through working sessions which will develop action plans that strengthen the teaching and learning of physics at all levels and in many countries.

The 2016 World Conference on Physics Education will be a concrete step forward in global cooperation. Envisaged as a series of conferences with a four year periodicity, it would be a working conference with follow-up actions that presumably would carry over to the following conference.

Presentation Topics:

1. ICT and Multi-Media in Physics Education
2. Teaching Physics Concepts
3. Learning Physics Concepts
4. Laboratory Activities in Physics Education
5. Primary School Physics
6. Secondary School Physics
7. University Physics
8. Initial Physics Teacher Education
9. Teacher Professional Development
10. Physics Curriculum
11. Motivational Strategies and Metacognition
12. History and Philosophy of Physics
13. Socio-cultural Issues
14. Physics Teaching and Learning in Informal Settings
15. International Perspectives
16. Various Topics Physics Education

Invited Speakers

Dr. Ian Laurence, Institute of Physics, UK

Prof. Laurence Viennot, emeritus profs of University of Paris Denis-Diderot, France

Prof. Leoš Dvořák, Faculty of Mathematics and Physics, Charles University, Czech Republic

Prof. Paula Heron, University of Washington, USA

Prof. Ton Ellermeijer, Foundation CMA, Amsterdam, Netherlands

Important dates:

Paper Submission Deadline	30th March
Notification of Acceptance	17th April
Beginning of Early-Bird registration	17th April
Early Registration Deadline	1st May
Registration Deadline for Inclusion in the Program	29th May
Conference Dates	11th-15th July

**GIREP SEMINAR 2016 IN KRAKOW, POLAND**

On the occasion of GIREP 50th Anniversary we would like to invite all GIREP current and past members and other supporters to take part in the GIREP Seminar 2016 in Krakow, Poland.

The general seminar topic:

Research-based proposals for improving physics teaching and learning – focus on laboratory work

The GIREP Seminar 2016 is a great opportunity to celebrate the 50th Anniversary of GIREP – International Research Group on Physics Teaching, gathering people interested to share their passion and their research in the field of physics education. A retrospective session will be organized on the first day of the meeting, with participation of noble guests who created and shaped GIREP ideas and work throughout 50 years.

The overall aim of the seminar is to draw attention to the variety of aspects of laboratory work, on one hand forming the environment where physics teaching and learning take place and on the other - being the method for development of physics literacy. The seminar will focus in particular on experimental labs, conceptual labs, multimedia labs, modern physics labs, research methods and the assessment of laboratory work.

The format of the seminar will be organized as following. Four to six themes will be selected by thematic group leaders. Each thematic group will be represented by one keynote, up to nine oral presentations and more than ten interactive poster presentations, followed by sessions of working groups proposed for in-depth discussions in small groups of researchers and practitioners, and led by the thematic group leaders. Each working group will be organized in two parts, in which the discussions will be developed in five steps:

1. general overview of the topic
2. preliminary discussion of the most important problems
3. more thorough discussion into specific aspects and possible solutions of the problem
4. general summary
5. discussion on the contribution of the workshop to the outcomes of the seminar



The web address for registration is:
www.girep2016.confer.uj.edu.pl/

50th Anniversary GIREP Seminar is organized on 30th Aug – 3rd September 2015 by Groupe International de Recherche sur l'Enseignement de la Physique (GIREP), Faculty of Physics, Astronomy and Applied Computer Science of the Jagiellonian University in Krakow

in cooperation with
European Physics Society – Physics Education Division (EPS-PED)
American Association of Physics Teachers (AAPT)
Multimedia in Physics Teaching and Learning (MPTL)
International Commission on Physics Education (ICPE)

Below an extended list of seminar topics is proposed in order to provide essential details of seminar themes and focuses. Some topics may be combined later on according to the structure of contributions in order to create broader themes of six Working Groups during the Seminar.

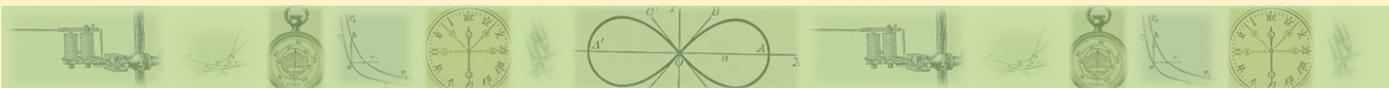
1. Experimental lab in introductory physics courses
2. Advanced experimental lab
3. Modern physics lab
4. Low cost experiments
5. Lab work and multimedia
6. Bridging between theory and experiments in teaching energy
7. Conceptual lab
8. Experiments and mathematization
9. Assessment for learning through experimentation
10. Classroom activities - a lab for teacher
11. Non-classical lab environments

Important Days

Proposals for workshops (priority to GIREP Thematic Groups)	January 4, 2015
Announcement of Thematic groups	February 16, 2015
Registration Open	January 15, 2016
Paper Submission Deadline	April 1, 2016
Notification of Acceptance	May 15, 2016
Early-Bird Registration Deadline	May 25, 2016
Regular Registration Deadline	June 25, 2016
Late Registration Deadline	July 15, 2016
Conference Days	August 30-September 3, 2016



The Wawel castle, Krakow



REPORT ON GIREP-EPEC CONFERENCE 2015 IN WROCLAW, POLAND

The Conference of International Research Group on Physics Teaching (GIREP) and European Physical Society - Physics Education Division (EPS PED), recognized by EPS as Europhysics Conference was organized by University of Wrocław (UWr) (Institute of Experimental Physics, Physics Teaching Department and Foundation for University of Wrocław) at the time of the Jubilee of the 70th Anniversary of the Polish Academic Community in Wrocław. It belongs to a series of GIREP conferences. The conference was being held in Wrocław, in City Haston Hotel and Congress Centre, in 6-10 July 2015. The address of web site is <http://girep2015.ifd.uni.wroc.pl/>. This conference was organized by prof. Ewa Dębowska (Chair of the Organizing Committee,) and dr. Tomasz Greczyło (Chair of the Local Organizing Committee), both from Institute of Experimental Physics of University of Wrocław in cooperation with the international advisory board (listed on the conference web page). The event was sponsored financially by GIREP, EPS - Physics Education Division, University of Wrocław and Polish Physical Society.

The main theme of the conference was Key Competences in Physics Teaching and Learning in the shape of knowledge, skills and attitudes that are fundamental ones for every individual in a society. The essence of KC is that they should be acquired by young people at the end of their compulsory education and training. The Key Competences are all interdependent and intertwine different aspects such as critical thinking, creativity, initiative, problem solving, risk assessment, decision taking and constructive management of feelings. All of them appear crucial in nowadays educational environment. The perfect media to support the process of teaching and learning seems to be the Information and Communication Technology (ICT). A great impact of ICT in educational processes is especially visible in physics teaching and learning. Physics is considered as a subject which main interest is directly and strongly connected not only to digital competence but also to several other Key Competences. The conference offered the opportunities for in-depth discussions of the Key Competences issues such as: New research approaches; new methods, innovative learning strategies, new models. KC changing pedagogy; formative assessment, teacher role, student role, KC oriented assessment, shared pedagogy, KC oriented pedagogy. Good practices in KC developing. During the meeting the problem of looking for strategies and tools to improve physics teaching and learning to teach these competences and to help students acquire them were discussed.

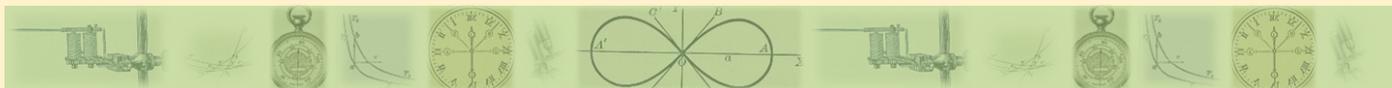
The Organising Committee received 165 abstracts for oral and poster presentations, seminars and symposiums, many of which were of a very high quality, and selection involved some very careful decisions. Only one abstract was rejected because of a controversial physics presented. In many language was improved.

The conference was attended by 157 participants (65 males and 92 females) representing 36 countries: Albania 1, Armenia 2, Australia 1, Austria 4, Belgium 5, Bosnia and Herzegovina 1, Brazil 1, Canada 4, Croatia 1, Czech Republic 22, Denmark 1, France 1, Germany 10, Greece 2, Hungary 4, Iran 1, Ireland 2, Italy 14, Israel 1, Japan 1, Korea 1, Latvia 1, Malta 1, Mexico 5, Netherlands 5, Poland 29, Portugal 1, Slovakia 3, Slovenia 9, Spain 2, Switzerland 3, Taiwan (ROC) 2, Turkey 3, Ukraine 2, United Kingdom 6, United States 5. Among the participants there were 29 students and 53 members of GIREP, AAPT and EPS.

Two persons were honored with awards during opening ceremony; GIREP Medal was given to prof. Lillian Mc Dermot, Physics Education Group, University of Washington, USA and the EPS Physics Education Division Secondary School Teacher Award 2015 went to Dr. Irena Dvorakova, from Prague (Czech Republic).

The scientific program offered 5 invited talks:

- Mojca Čepič (Faculty of Education, University of Ljubljana, Slovenia), *“Introduction of current scientific results to education: Experiences from the case of liquid crystals”*,



- Gareth Jones (Department of Physics, Imperial College London, United Kingdom), *"Competence and Understanding: Delivering Physics courses to produce both"*,
- Knut Neumann (Leibniz Institute for Science and Mathematics Education, University of Kiel, Germany), *"Structure and Development of Students' Competence in Physics"*,
- Edward F. Redish (Department of Physics, University of Maryland, USA), *"Analyzing the competency of mathematical modeling in physics"*,
- Roman Rosiek (Institute of Physics, Pedagogical University, Cracow, Poland), *"Psychophysiological methods in research on science education"*,

15 oral sessions with 60 presentations, 3 symposiums with 18 presentations, 8 workshops, 2 EPS sponsored Workshops "Specialist Physics Teacher Shortages and the Preparation of School Leavers for Further Study" and 4 poster sessions, grouped 2 by 2, with 32 posters in each group. The EPS workshops were run in conjunction with Horizons of Physics Education (HOPE [2]) and aimed to our understanding of teacher shortages and their effects on pupils across Europe. Ten travel bursaries of up to 200€ each were available to participants of EPS sponsored Workshops wishing to address the issue of teacher shortages and preparation of school leavers for further study in physics. The workshops were led by the Chair of the Physics Education Division of the EPS, Dr. David Sands.

GIREP-EPEC 2015 recognized as Europhysics Conference received from European Physical Society 3 EPS Europhysics Conference Grants (student grants) for an amount of 350€ each, which went to:

- Jasmina Balukovic, Department of Physics, Faculty of Science in Sarajevo, Bosnia and Herzegovina,
- Illya Datsenko from Kharkiv National Medical University, Ukraine,
- Bogdan Łabędź, Jagiellonian University, Cracow, Poland,

1 EPS Invited Speaker Grant for an amount of 500€ for prof. Edward F. Redish (Department of Physics, University of Maryland, USA, redish@umd.edu).

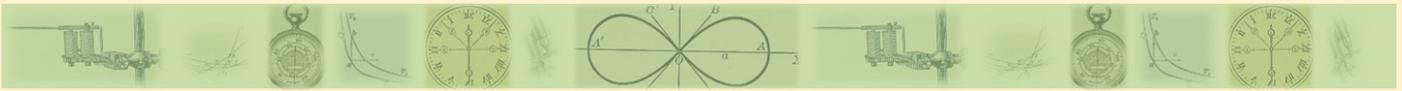
1 EPS Poster Prize of an amount of 200€ for researcher in the PhD phase of his/her career in recognition of an excellent poster at the conference for Petr Kacovsky "The position of experiments in grammar school students' semantic space", Charles University in Prague, Faculty of Mathematics and Physics,

All the participants were asked to fill an evaluation questionnaire taking into account such aspects of the meeting as: the conference program, the venue, the organization and the social program of the event. Only 55 sheets were completed and the results, in the Likert 1 – 5 scale, show that such a conference is an important place to shear ideas and the results of work in physics education domain (4,8), the topic of the conference was interesting and important (4,49) and the overall structure of the conference was accurate (4,44).

A book of Proceedings will be printed and electronically available at the end of June 2016.

Like in previous GIREP conferences, a lot of attention went to engaging teachers in taking part and establish better networks between teachers and researchers. This time the format of a preconference in 6 workshops organized in 3 parallel sessions was suggested. They were held in the afternoon on July 5 and July 6 in the morning in the same venue as the GIREP EPEC 2015 conference. They were attended by 35 people. Two workshops were in Polish and four workshops (Embedded Formative Assessment and Feedback for Student and Teacher Learning, The use of ARDUINO in IBL, Investigating with Concept Cartoons, Versatile ICT Learning Environment to enable context-rich and authentic Physics Education) for international audience.

E. Dębowska and T. Greczyło, GIREP-EPEC Local organizing committee



PARTICIPANTS' REFLECTIONS ON GIREP-EPEC 2015

For the first time, we visited a physics education conference, namely GIREP- EPEC in Wroclaw (Poland). We were submerged in competences, formative assessment and general physics education. International educational researchers were presenting their findings in various talks, workshops and posters. Outside the regular program, there was plenty of time for informal discussions.

The many talks we attended showed us the wide variety of research in different countries with various educational systems and goals. Areas from kindergarten to university were covered, for both teachers and students. A range of teaching methodologies were discussed, from smallest details to broad overviews. The overviews were mostly provided by internationally recognized researchers during the general talks in the morning. These warming up sessions started the thinking processes with all participants and prepared us for another intense day of learning. The regular cup of coffee (and virtual cookies) got us through this week just fine though. The meals were very pleasant and a perfect time to have a chat and exchange ideas with all the new people we've met.

At the end of this week our heads are packed with new theories, models, insights, experimental results and other information. On the flight back home we feel very strongly we should ask our professors for a few days off just to let it all sink in, so we can use this information to implement in our own research.

We'll be back at GIREP next time!

Leen Goovaerts and Stijn Ceuppens (PhD students KU Leuven)

In 2003 I attended GIREP Seminar in Udine, Italy. It was my first experience with international academic conferences held in Europe. I was so happy with the Seminar that in the same year I became a member of GIREP. GIREP- EPEC 2015 is the fifth GIREP conference which I attended since then. The theme of the conference was very important for me because the competency-based education has become one of the objectives of general education reform in my country since 2004. The general talks, oral and poster presentations, personal interactions with the conference participants gave me valuable insights into the situation with identifying and developing competences in students in physics classrooms in other countries of the world. The conference was professionally organized and the venue was outstanding. I really enjoyed every day of the conference.

Many thanks to all organizers of a very successful conference!

Julietta Mirzoyan, Armenia

GIREP REPRESENTATION AT SCIENCE EDUCATION CONFERENCES

One integral part of cooperation between partner organizations are mutual participations at conferences. In 2015 GIREP was present at several International Physics and Science Education Conferences across the world.

ESERA 2015 Conference, Helsinki, Finland, Aug. 31- Sept. 4, organized by the University of Helsinki, invited GIREP President, Marisa Michelini to present a symposium held by GIREP organization, entitled *Content-focused researches on students and teachers learning carried out on optics in GIREP*

Organizers: Marisa Michelini, GIREP President, University of Udine, Italy

Bat-Sheva Eylon, Weizmann Institute of Science, Israel

Chair: Laurence Viennot, Université Paris Diderot, France

Contributors:

1. Simarro, C, Lopez, V, Pintó, R. CRECIM, Universitat Autònoma de Barcelona, Spain
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4. Marisa Michelini and Alberto Stefanel, University of Udine, Italy
5. Bat-Sheva Eylon^a, Yaron Lehavi^{a,b}, Esther Bagno^a, Roni Mualem^a, Gesche Pospiech^c, Ulrike Böhm^d, Olaf Krey^e, Ricardo Karam^f of a) Weizmann Institute of Science; b)The David Yellin Academic College of Education; c)Technische Universität Dresden; d)Gymnasium Coswig, Dresden; e)Martin Luther University Halle-Wittenberg; f)University of Copenhagen

Discussant: Costas P Constantinou, University of Cyprus, Cyprus

<http://www.esera2015.org>

The **MPTL 2015 Conference, Munich, Germany, September 9-11** took place at the Ludwig-Maximilians-Universität München. GIREP Vice-President, Claudia Haagen-Schuetzenhoefer participated in this event on behalf of GIREP.

<http://www.en.didaktik.physik.uni-muenchen.de/mptl/index.html>



WHAT IS GOING ON? NEWS FLASHES FROM GIREP COUNTRIES

HEUREKA WORKSHOPS 2015

Both traditional and non-traditional – that’s how the annual conference of Czech physics teachers *Heureka Workshops* can be characterized. Why inform here about a local conference where, moreover, most of the communication does not take place in English? Well, each year several guests from other countries participate, some leading their own workshops. Also, our experience proved that language is not a barrier at all, mixture of Czech and English works quite well. And besides, the non-traditional aspects of Heureka Workshops can be interesting for you and perhaps attract you to come to some of future years of this conference. Although a short information on these conferences was already published in this Newsletter a few years ago [1], it may be worth mentioning how they are evolving and why they can be attractive.

Let’s start with more traditional features of the conference. It takes place annually since 2002 and physics teachers and educators participate at it in growing numbers, starting from less than fifty in the first year to this year’s more than 120. Also, there are conference proceedings (printed ones in first years, then on CD, now published on the web, all with ISBN). The conference was also mentioned in several brief reports in international journals, for the last one see [2].

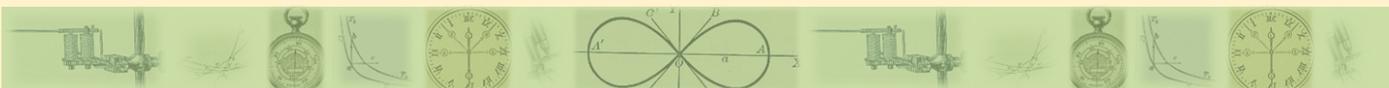


So, what is non-traditional at this conference? First less traditional aspect is the fact that it really reflects its title: it consists just of workshops, there are no lectures, oral contributions or posters there. In spite of this the program offers quite a lot. Each workshop lasts 90 minutes and repeats several times (four times, in most cases). The conference takes place from Friday evening till Sunday afternoon to enable teachers to participate without interfering with their school duties. (This year it took place on October 2-4, 2015.) During the weekend, there are eight “time slots” for workshops, seven to eight workshops running in parallel in each of them. This year, there were twenty different workshops in total with topics ranging from simple electric circuits for pupils of age 12-15 to geophysics or from folding paper models to peer instruction or projects with Arduino, as you can see on the web page [3].

Further aspects are even more unconventional. Heureka Workshops take place in a secondary school (gymnasium) in a smaller town Náchod. (It takes some two hours to get there from Prague.) Not only all workshops take place there; also participants stay there, sleeping in their sleeping bags in the classrooms. (Well, it is not banned to stay in a hotel



if one likes so you don’t need to be afraid to come even if you prefer bed to a sleeping bag.) Thanks to that the atmosphere of the event is very informal and the participants often discuss physics, teaching and other problems till late at night, sometimes doing experiments long after the official workshop hours. Also, participants can bring their own children to Náchod; this year there were about 25 children of all ages there, often also participating in workshops. Counting children, the total number of people was nearly 150, which is close to the capacity of the school – but the local organizer, Zdeněk Polák (physics teacher, well known also to participants of international Science on Stage events) says that there are still some possibilities to expand.



Informal character concerns also other aspects. No catering is organized (there are nearby restaurants and supermarkets to fulfil everybody's needs) and surely there is nothing like a conference dinner (but singing with guitars, which often takes place during the evenings, is a very good substitution). On the other hand – the whole event is completely free of charge. Of course, it lacks the luxury of five-star hotels, but it is clear that this is not what is decisive for the participants, as it is proved by the fact that they return each year in growing numbers. Also, their only complaint is that a weekend is short and the lack of time prevents them from visiting all workshops they would like to attend.

The conference, being important by itself, is a part of a long-time informal project called "Heureka". Its main "soul, engine and leader", Irena Dvořáková, was awarded the EPS Teacher Award for this and connected activities; the award was given to her at GIREP-EPEC 2015 conference in Wroclaw. The Heureka Workshops conference surely cannot give a complete idea about the Heureka project, which is much wider and deeper, see [4]. However, it offers inspiration and experience also to people who are not involved directly in the project because it is open to all physics teachers and educators.



So, why can all of this be interesting for you? The Heureka Workshop conference shows that it is possible to organize very low-cost events for non-negligible number of physics teachers, events that are popular, attractive and useful. This may be perhaps some inspiration for organizers of similar activities. If you are one of them, we would be glad to share our and your experience. However, our offer is not limited to organizers. Few years ago a teacher from west coast of USA found Heureka Workshops on the web and (having some cheap or free flight) came to attend the conference. You can do the same. In case you are interested or just curious, contact us – and make a note in your time plan for a weekend September 30-October 2, 2016.

We will be glad to see you (yes, I mean just you, personally 😊), as a participant or a workshop leader at Heureka Workshops 2016.

Leoš Dvořák

Department of Physics Education

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Contact concerning Heureka Workshops conference:

Irena Dvořáková, irena.dvorakova@mff.cuni.cz

References:

[1] Dvořák L.: *Conferences of physics teachers in the "heart of Europe*. GIREP Newsletter, Nov. 2011, p.7-9. Available online: <https://girep.org/newsletters/newsletter49.pdf>

[2] Swinbank E.: *Heureka moments*. Physics Education 50 (May 2015), p. 273-275.

[3] Online: http://kdf.mff.cuni.cz/heureka/uploads/nachod2015/prehled_en.pdf

[4] Dvořáková I.: *Active learning in the Heureka Project*. In: ICPE-EPEC 2013 Conference Proceedings. Charles Univ.in Prague, 2014, p. 47-62. Available online:

http://iupap-icpe.org/publications/proceedings/ICPE-EPEC_2013_proceedings.pdf

FUTURE CONFERENCES



The World Conference on Physics Education 2016

WCPE 2016 will be held 11-16 July in São Paulo (Brazil) as a joint conference by several institutions (GIREP & ICPE plus endorsing organizations).

<http://wcpe2016.org/>

AAPT Summer Meeting 2016

The AAPT Summer Meeting will be held organized this year on 16-20 of July by the California State University in Sacramento, California

GIREP 50th Anniversary Seminar 2016

GIREP Seminar 2016 will be organized by Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University in Krakow, Poland.

www.girep2016.confer.uj.edu.pl/

GIREP-ICPE-EPEC 2017

GIREP-ICPE-EPEC 2015 Conference/Seminar will be held in Dublin, organized by Eilish McLoughlin from Dublin City University.

GIREP-MPTL Conference in 2018

This conference is planned in San Sebastian.

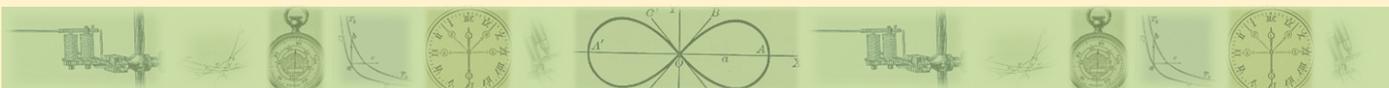
ANNOUNCEMENT

PhD course in Copenhagen (September 19-23, 2016):

Educational Implications of the History and Philosophy of Science and Mathematics

This international doctoral course will focus on the utilization of historical and philosophical scholarship to inform science and mathematics education. The course will present an overview of this research tradition and discuss educational implications of HPS&M based on the analysis of case studies from different disciplines. Among the course lecturers are Michael Matthews (founding editor of Science & Education), Peter Heering (Past President IHPST), Helge Kragh (History of Physics) and Jesper Lützen (History of Mathematics). The course is free of charge for the participants (including lunch) and can have a maximum of 25 participants.

More information about the course and a registration link can be found at www.ind.ku.dk/hpscource. Contact the course responsible Ricardo Karam (ricardo.karam@ind.ku.dk) for further questions.



GIREP MEMBERSHIP RENEWAL & FEES

We would like to thank all members for supporting GIREP in 2015 and hope for further support. The current fee for GIREP membership is due from the beginning of 2016. Payment information can be found on the GIREP homepage (<https://www.girep.org/information.html>)

We also invite everybody interested in physics teaching and learning as well as in physics education research to join GIREP. You can become member easily. Just follow this link: <https://www.girep.org/register.html>

As a GIREP member you have **exclusive access** to the digital proceedings of the past GIREP conferences. In addition you can get a **reduced registration fee** for GIREP conferences and for conferences of our partner organisations (see GIREP Newsletter 54).



CALL FOR CONTRIBUTIONS TO THE GIREP NEWSLETTER

We would like to encourage all GIREP newsletter readers to participate in sharing news and ideas about physics teaching and learning and physics education research. Please, send contributions for the next GIREP Newsletter to GIREP Secretary, Dagmara Sokółowska dagmara.sokolowska@uj.edu.pl until the end of September 2016.

Credits

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