

Teaching the **TEmi** way



Congress

April 15-17, 2016

Leiden, The Netherlands

Programme



TEACHING ENQUIRY
with MYSTERIES INCORPORATED



Co-funded by the 7th
Framework Programme
of the European Union

Programme

Friday, April 15

- 13.30 - 16.45** **Pre-congress Space Awareness Workshop**
Leiden Old Observatory - Rapenburg 73
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- 17.00 - 18.00** **Registration** - *Academy Building - Rapenburg 73*
- 18.00 - 18.15** **Opening**
- 18.15 - 19.15** **Keynote speeches**
- 19.15 - 20.30** **Light buffet**
- 21.00 - 22.30** **The Light Mystery theatre show** - *Aalmarktzaal - Breestraat 60*

Saturday, April 16

Scheltema - Marksteeg 1

- 08:00 - 09:00** **Registration**
- 09:00 - 10:00** **Keynote speeches**
- 10:00 - 10:30** **Coffee break**
- 10.30 - 12.00** **SESSION 1 Workshops**
- 12:00 - 13:30** **Lunch**
- 13.30 - 15.00** **SESSION 2 Workshops**
- 15:00 - 15:30** **Coffee Break**
- 15.30 - 17.00** **SESSION 3 Workshops**
- 19:00 - 20:00** **Reception and fair**
- 20:00 - 22:00** **Magic dinner**

Sunday, April 17

Scheltema - Marksteeg 1

- 09.00 - 10.30** **SESSION 4 Workshops**
- 10.30 - 11.00** **Coffee Break**
- 11.00 - 12.30** **SESSION 5 Workshops**
- 12:30 - 13:00** **Closing remarks**
- 13:00 - 13:30** **Grand finale**
- 13:30 - 14:30** **Lunch**

Friday, April 15

Academy Building - Rapenburg 73

PRE-EVENT SESSION / 13.30 - 16.45

Workshop:

Space Awareness, inspiring a new generation of space explorers

Join the pre-event of the TEMI conference and learn how to use space as an interdisciplinary and exciting way of raising children's interest in science, technology, and related careers.

13:30-14:00	Welcome
14:00-15:30	Workshop: Space Awareness, inspiring a new generation of space explorers
15:30-15:45	Coffee break
15:45-16:45	Visit of the Old Observatory Space

Awareness combines the vastness and beauty of the Universe with the challenges of global concerns and current space missions, stimulating a sense of global citizenship. It offers high quality tools and activities for educators and children from 8 to 18 to develop an interest in science, technology, and space careers. During the workshop, participants will explore how Space Awareness can inspire to engage students with science and global issues using inquiry based activities. Attendees will be presented an overview of the Space Awareness resources and how they can be used complementary to foster inclusion and diversity amongst students

Chair : University of Leiden

Audrey Karczynska

TARGET GROUP: teachers

FORMAT: presentation and visit

MAIN TEMI THEME: Inquiry Based Science Education



Friday, April 15

Academy Building - Rapenburg 73

18.00 - 19.15

OPENING

PETER MCOWAN, Professor of Computer Science and Vice Principal Public Engagement, Queen Mary University of London

HAN DE WINDE, Faculty of Science - Vice Dean and Education Portfolio, University of Leiden

HENRI LENFERINK, Mayor of Leiden

MARIA KARAMITROU, Project and Policy Officer, European Commission

KEYNOTE SPEECHES

Scratch that itch - getting them curious

PAUL MCCRORY, Director, Learn Differently Ltd

Learning, and science education in particular, is full of mysteries and opportunities to provoke curiosity. So how can teachers scatter this emotional and cognitive itching powder to excite, rather than frustrate, their students? Discover some of the psychological and performance secrets used by magicians and street buskers to interest their audiences, and learn how educators can apply these techniques. Find out how inventing a toy, instead of doing his homework, made one student a fortune.

Have we revealed the mystery of inquiry teaching?

SUZANNE KAPELARI, Assistant Professor in Science Education and Head of Austrian Education Competence Center Biology, Center of Teacher Education, University of Vienna

In 2007 - eight years ago- the Rocard report asked for renewing science education in Europe and advertised inquiry based science education (IBSE) as the remedy for many problems we were facing in science education those days. Several innovative education projects were launched and successfully implemented in many European countries. Which lessons did we learn? Which questions do we still need to answer?

Presents: MATT PARKER, Mathematician, stand up comedian, Queen Mary University of London

LIGHT BUFFET

19.15 - 20.30

The Light Mystery theatre show

Aalmarktzaal - Breestraat 60

21.00 - 22.30

Original Italian version by Marina Carpineti, Marco Giliberti and Nicola Ludwig

Translated in English by Nicholas Sarson, Dorothee Loziak and Peter McOwan

Actors: Marina Carpineti, Marco Giliberti and Nicola Ludwig

Director: Emiliano Bronzino

An alleged alien, a university professor and a teacher find themselves by chance together with a secondary school class, in midst of traditional teaching and an exam. Through a series of fun experimental adventures and engaging stories they explore ideas around the properties of light, of motion and gravity, and the electromagnetic spectrum. The play is a critical analysis of the strengths and weaknesses of traditional by the book teaching methods, a pedagogy where the teacher explains topics and gives answers to questions students have not even asked. This counterpoints the other approach which runs through the play, around enquiry based learning, where the students undertake their own research to explore and understand the topics.

Saturday, April 16

Scheltema - Marksteeg 1

09.00 - 10.00

KEYNOTE SPEECHES

The DG R&I report science education for active citizenship to enhance STEM education across Europe in the years ahead

YVES BEERNAERT, Member of the European Commission's Expert Group on Science Education, Educonsult

"Science Education for Active citizenship" is a publication on science education offers a 21st century vision for science for society within the broader European agenda. This report is aimed primarily at science education policy makers. It identifies the main issues involved in helping citizens to access scientific debate. It provides guidance on how industry can contribute to science education; and it proposes a new framework for all types of science education from formal, to non-formal and informal approaches.

Public engagement has already made a real difference in the governance and decision-making process of Horizon 2020: providing a space for the citizen to tell us what works and what doesn't, what's important and what's not.

The report makes a substantive contribution to the policy debate within Europe on how best to equip citizens with the skills they need for active participation in the processes that will shape everyone's lives.

Our Vision for TEMI

JULIE JORDAN, Director of Professional Development, Centre for Science Education, Sheffield Hallam University

JOHN WALKER, Science Subject Lead, Teach First, Sheffield Hallam University

This introductory session will present an overview of the TEMI methodology to reveal how four innovations can enhance science teacher professional development programmes, the science curriculum and student engagement in the science classroom.



SESSION 1 / 10.30 - 12.00

Workshop #1.1 (also #5.1) **Worst scenarios: an inquiry into science education projects nightmares - "It could be worse. It could be raining."**

Once upon a time... in a rare land called Europium, there was an innovative science education project and a smart policy for science education. It had a wonderful international team of long time experts, was tackling a catchy topic and funds to go on for several years. What could possibly go wrong? Come and imagine the rest of the story and the worst possible scenarios for an innovative science education project. In small groups, reflecting on real cases and using their experience and creativity, participants will identify disrupting elements that can punctuate the life of a project. They will then share their story with the whole group. By the end of the workshop, participants will have generated a list of risks and a precious analysis of potential obstacles to be aware of for future projects and policies they might lead.

Chair: Traces
Target group: policymakers, researchers
Format: interactive session
Main TEMI theme: policies

Workshop #1.4 (also #4.5) **Bubbles in Bubble Tea: No! - Bubbles in Science Classes: Yes?**

Mysterious phenomena can provoke situations that lead over to scientific inquiry. One such phenomenon emerging in the life of students some years ago was bubble tea. Bubble tea was a trend spilling over from Eastern Asia to Western countries around the year 2009. It is a tea-based drink with milk or juice added that contains fruit jellies or tapioca and alginate based spheres (the bubbles). In some European countries bubble teas were criticized to represent another high calories food specially advertised for the youth. With its critical reception in the media the hype around bubble tea started disappearing. Anyhow, there are still shops offering bubble tea. Whatever one may think about bubble tea, the bubbles, their formation and the chance to fill them with different compounds allows the creation of challenging and aesthetic demonstrations in science class. This workshop presents some ideas to use alginate bubbles in class that were developed in the framework of the TEMI-project.

Chair: Bremen University
Target group: teachers, teachers' trainers, researchers, informal learning community
Format: hands-on activity
Main TEMI theme: mysteries, inquiry based science education

Workshop #1.2 (also #5.2) **The student experience of TEMI**

This session will be a hands-on interactive opportunity for delegates to experience the four innovations of TEMI through several authentic teaching scenarios. By experiencing the activities from the perspective of students, delegates will gain an appreciation of how the TEMI approach is intended to work in the classroom. Delegates will be able to see student and teacher materials for different activities developed by Sheffield Hallam University.

Chair: Sheffield Hallam University
Target group: teachers, teachers' trainers, policymakers, researchers, informal learning community
Main TEMI theme: gradual release of responsibility, showmanship, 5E, mysteries

Workshop #1.5 (also #5.6) **See the atom, touch the atom!**

The topic nanotechnology is a well known issue associated with discoveries of practical application. Although it is not reflected in national curricula, it can be an attractive theme for students who see the result of natural science research. Can you imagine how small "nanoworld" is? How could we visualize it? Is it possible to touch nanoparticles? The participants of the workshop will get to know what is nano, they will play a game on nano, see some demonstrations on scanning probe microscopy (SPM) and also see the tiniest film ever, "A boy and his atom".

Chair: Charles University
Target group: teachers, teachers' trainers, policymakers
Format: hands-on activity
Main TEMI theme: mysteries, policies

Workshop #1.3 (also #4.3) **How magicians fool our brains. What a teacher can learn from a magician?**

Medical student and performer of Theatrical Magic, Kristine Hjulstad, explains how she uses magic tricks to illustrate the strengths and weaknesses of human perception. For three years Kristine has travelled with her performance "Hjerne det"! ("The Brain") entertaining and teaching pupils age 8-12 principles of neuro physiology and conjuring. The workshop will discuss what teachers can learn from a magician and bring back in the classroom.

Chair: University College of Southeast Norway
Target group: teachers
Format: hands-on activity
Main TEMI theme: showmanship

Workshop #1.6 (also #3.3) **Maths made magic**

Magical mysteries can provide a powerful way to engage students, in this session we look at how self working card tricks can be used in this context to teach mathematics. The session will showcase a selection of magic effects where the hidden technique is mathematical. Participants will have the opportunity to both experience the lessons, observe how the TEMI teaching innovations are incorporated and discuss the activity with experienced practitioners

Chair: Queen Mary University of London
Target group: teachers
Format: hands-on activity
Main TEMI theme: showmanship, mysteries, 5E

SESSION 2 / 13.30 - 15.30

Workshop #2.1 (also #4.1) **Big unsolved science mysteries in the classroom**

Big Science projects are trying to solve some of the thoughts mysteries in modern science. Projects like the CERN LHC, ESO's E-ELT, ESA's Euclid are addressing some of the most fundamental science questions: Is there life in the outer space? How did life originate? What is dark matter? In this workshop we will explore some current mysteries of modern science. Big Science projects follow in many ways a similar approach than TEMI, using big science mysteries to drive modern science and technology development. During his workshop will provide an overview of current Big Science projects, discuss the big science mysteries behind them and test some ideas on how to use these cutting edge mysteries in the classroom. Moreover we will also discuss and experiment on how Big Science can be used by policy-makers and curriculum developers.

Chair: Leiden University, LCOGT, IEC
Target group: policymakers, project managers in STEM initiatives
Format: interactive session
Main TEMI theme: policies, 5E, mysteries

Workshop #2.4 (also #5.5) **Discovering the 5Es using indicators**

The workshop focuses on the 5E instructional model and its different phases. The participants have the chance to experience three phases (Engage, Explore, Explain) by themselves and will be inspired by the workshop leaders for the other two phases (Elaborate, Evaluate).

The activities during the workshop are based on the mystery "The (un)reliable indicator". The participants will discover and discuss this mystery and the workshop leaders will support them to explain the chemical background on different levels. Furthermore, there will be suggestions for different possibilities to create the Elaborate-phase and hints on aspects to Evaluate.

Chair: University of Vienna
Target group: teachers, teachers' trainers, policymakers
Format: hands-on activity
Main TEMI theme: 5E

Workshop #2.2 (also #4.2) **Responsible research and teaching strategies**

How can the responsible research and innovation paradigm affect the way of teaching science? A new way of conceiving science communication is starting including a new role for researchers and citizens. Within this process teachers and students can play a role to be completely design. The workshop will focus on discussing and define strategies to integrate researchers in teaching activities not only as external experts to be consulted on a specific topic but as social actor able to plan real research activities tailored on students and citizens needs.

The workshop will also focus on how new teachers' training can be implemented to better link societal issues, researchers' activities, citizens' needs and students motivations and interests.

Chair: Sterrenlab and PsiQuadro
Target group: policymakers
Format: interactive session
Main TEMI theme: policies

Workshop #2.5 (also #4.6) **The circus of mysteries**

The workshop will consist of a circus of 6-8 mysteries. The teachers will work in groups of 2 or 3 and briefly try out each mystery (45 minutes). In their groups they will then choose one mystery and discuss how to turn it into a lesson using a simple template based on the 5E model (20 minutes). Each group will then report briefly on how they would develop their mystery, and how it would fit into their school science curriculum. Ideas for using showmanship in relation to the mysteries will be discussed.

Chair: University of Limerick
Target group: teachers
Format: hands-on activity
Main TEMI theme: mysteries

Workshop #2.3 **Theatre and Science I**

The workshop aims at discussing the presentation of science through drama. Starting from an introduction of the main subject of the workshop - "Leonardos' codices" participants will choose a subject to work on facilitated by the convenor. The workshop is divided into two parts: Theatre: theoretical and practical forms of expression
Science: exercises about storytelling of scientific topics
The work will be coordinated by an actor and a by professional director together with the TEMI team of the University of Milan. Participants to the II part must have attended part I.

Chair: University of Milan
Target group: teachers, teachers' trainers, policymakers, project managers in STEM initiatives, researchers, informal learning community
Format: interactive session
Main TEMI theme: showmanship

Workshop #2.6 **The synergetic link between Showmanship and Inquiry: some practical examples**

Showmanship, one of the four pillars of the TEMI project, is the ability to build and maintain an audience's focus. In the classroom teachers naturally use showmanship in their work when trying to focus students attention on the material being taught, on specific exercises, etc.
In the framework of the TEMI projects we investigated ways in which showmanship can be used within Inquiry Based Science Education (IBSE). We discovered several conformation in which showmanship can be used to engage students, to maintain their engagement and motivation throughout the inquiry activity, to aid explanations of the phenomenon at hand and to extend the inquiry into new realms. Engagement throughout the activity should help students better learn and remember.

Chair: Weizmann Institute
Target group: teachers, teachers' trainers, project managers in STEM initiatives, researchers, policymakers
Format: interactive session
Main TEMI theme: showmanship, mysteries, 5E, inquiry based science learning

SESSION 3 / 15.30 - 17.00

Workshop #3.1

The imaginary magazine of science education

Which are the main issues that science education is currently facing in Europe? How can policymakers, teachers, project managers, informal educators and researchers contribute to the discussion? What is the legacy of TEMI and other European projects? The Imaginary Magazine is a discussion tool based on the editorial model of newspapers and magazines. During a brief period of time, participants have to create a publication on a certain topic, a task that requires a certain vision and anticipation of a desired future. Timing restrictions will result in 'fake' - read 'latin' body texts, yet the visuals and headlines and navigation concept developed by the participants will create an imaginary magazine that tells a possible future. The Imaginary Magazine can be printed in limited quantities, and thus become an important trace of the discussions as well as a road map to the future

Chair: Sterrenlab

Target group: teachers, teachers' trainers, policymakers, project managers in STEM initiatives, researchers, informal learning community

Format: interactive session

Main TEMI theme: inquiry based science learning

Workshop #3.4 (also #5.3)

Make your own mystery videos with tablet PCs or smartphones

More and more schools have access to tablet PCs, nearly every student has now a smartphone. Why not to use these devices to make your own mystery videos for use in class or for uploading them on YouTube. The workshop presents easy ways to make experimental videos with handheld devices. The participants can try them out and create their own small videos of some mystery experiments.

Chair: University of Bremen

Target group: teachers, teachers' trainers

Format: interactive session

Main TEMI theme: mysteries, inquiry based science learning

Workshop #3.2

Theatre and Science II

The workshop aims at discussing the presentation of science through drama. Starting from an introduction of the main subject of the workshop - "Leonardos' codices" participants will choose a subject to work on facilitated by the convenor. The workshop is divided into two parts:

Theatre: theoretical and practical forms of expression

Science: exercises about storytelling of scientific topics

The work will be coordinated by an actor and a by professional director together with the TEMI team of the University of Milan. Participants to the II part must have attended part I.

Chair: University of Milan

Target group: teachers, teachers' trainers, policymakers, project managers in STEM initiatives, researchers, informal learning community

Format: interactive session

Main TEMI theme: showmanship

Workshop #3.2 (also #1.6)

Maths made magic

Magical mysteries can provide a powerful way to engage students, in this session we look at how self working card tricks can be used in this context to teach mathematics. The session will showcase a selection of magic effects where the hidden technique is mathematical. Participants will have the opportunity to both experience the lessons, observe how the TEMI teaching innovations are incorporated and discuss the activity with experienced practitioners

Chair: Queen Mary University of London

Target group: teachers

Format: hands-on activity

Main TEMI theme: showmanship, mysteries, 5E

Workshop #3.5

Let there be light!

Luminescence is a multidisciplinary topic that can be discussed in physics, chemistry or biology. The participants of the workshop will get to know the phenomenon of luminescence, where it comes from, what is luminol and what forms of luminescence we can see (bioluminescence, photoluminescence, thermoluminescence, mechanoluminescence and others). They will see some practical illustrations and experiments concerning luminescence.

Chair: Charles University

Target group: teachers, teachers' trainers

Format: panel

Main TEMI theme: mysteries, inquiry based science learning

Workshop #3.6 (also #4.4)

Mystery suite

This taster workshop will consist of a potpourri of activities developed by Israeli TEMI teachers and the Weizmann TEMI Team. In small groups participants will have a short "date" with a mystery. They will then move to the next mystery on the date list (four in total).

Stories are a powerful tool that has been around since man invented language and have been used for centuries to convey information in a memorable and engaging manner. Thus, the use of stories in the classroom should increase motivation and engagement in science and in IBSE. In the taster workshop participants will experience the power of stories through the activities presented.

The workshop will conclude with a discussion of the underlying pedagogies (such as showmanship and 5E's), their suitability to class, their suitability to the curriculum and a reflection on how they might be adapted to local contexts.

Chair: Weizmann Institute

Target group: teachers, teachers' trainers, informal learning community, project managers in STEM initiatives

Format: hands-on activity

Main TEMI theme: showmanship, mysteries, 5E, inquiry based science learning

Saturday, April 16

Scheltema - Marksteeg 1

EVENING PROGRAMME

TEMI fair

19.00 - 20.00

Visit the TEMI fair where teachers from each member country will show how the TEMI methodology has been adapted to the national curricula and local constraints. Scientix and Science on Stage will display a wide range of opportunities for European teachers.

Magic dinner

20.00 - 22.00

Magic entertainment will be provided at the tables by magicians Tilman Andris, Kristine Hjulstad and Quintus van Amstel.



SESSION 4 / 9.00 - 10.30

Workshop #4.1 (also #2.1) Big unsolved science mysteries in the classroom

Big Science projects are trying to solve some of the thoughts mysteries in modern science. Projects like the CERN LHC, ESO's E-ELT, ESA's Euclid are addressing some of the most fundamental science questions: Is there life in the outer space? How did life originate? What is dark matter? In this workshop we will explore some current mysteries of modern science. Big Science projects follow in many ways a similar approach than TEMI, using big science mysteries to drive modern science and technology development. During his workshop will provide an overview of current Big Science projects, discuss the big science mysteries behind them and test some ideas on how to use these cutting edge mysteries in the classroom. Moreover we will also discuss and experiment on how Big Science can be used by policy-makers and curriculum developers.

Chair: Leiden University, LCOGT, IEC
Target group: policymakers, project managers in STEM initiatives
Format: interactive session
Main TEMI theme: policies, 5E, mysteries

Workshop #4.4 (also #3.6) Mystery suite

This taster workshop will consist of a potpourri of activities developed by Israeli TEMI teachers and the Weizmann TEMI Team. In small groups participants will have a short "date" with a mystery. They will then move to the next mystery on the date list (four in total).

Stories are a powerful tool that has been around since man invented language and have been used for centuries to convey information in a memorable and engaging manner. Thus, the use of stories in the classroom should increase motivation and engagement in science and in IBSE. In the taster workshop participants will experience the power of stories through the activities presented.

The workshop will conclude with a discussion of the underlying pedagogies (such as showmanship and 5E's), their suitability to class, their suitability to the curriculum and a reflection on how they might be adapted to local contexts.

Chair: Weizmann Institute
Target group: teachers, teachers' trainers, informal learning community, project managers in STEM initiatives
Format: hands-on activity
Main TEMI theme: showmanship, mysteries, 5E, inquiry based science learning

Workshop #4.2 (also #2.2) Responsible research and teaching strategies

How can the responsible research and innovation paradigm affect the way of teaching science? A new way of conceiving science communication is starting including a new role for researchers and citizens. Within this process teachers and students can play a role to be completely design. The workshop will focus on discussing and define strategies to integrate researchers in teaching activities not only as external experts to be consulted on a specific topic but as social actor able to plan real research activities tailored on students and citizens needs.

The workshop will also focus on how new teachers' training can be implemented to better link societal issues, researchers' activities, citizens' needs and students motivations and interests.

Chair: Sterrenlab and PsiQuadro
Target group: policymakers
Format: interactive session
Main TEMI theme: policies

Workshop #4.5 (also #1.4) Bubbles in Bubble Tea: No! - Bubbles in Science Classes: Yes?

Mysterious phenomena can provoke situations that lead over to scientific inquiry. One such phenomenon emerging in the life of students some years ago was bubble tea. Bubble tea was a trend spilling over from Eastern Asia to Western countries around the year 2009. It is a tea-based drink with milk or juice added that contains fruit jellies or tapioca and alginate based spheres (the bubbles). In some European countries bubble teas were criticized to represent another high calories food specially advertised for the youth. With its critical reception in the media the hype around bubble tea started disappearing. Anyhow, there are still shops offering bubble tea. Whatever one may think about bubble tea, the bubbles, their formation and the chance to fill them with different compounds allows the creation of challenging and aesthetic demonstrations in science class. This workshop presents some ideas to use alginate bubbles in class that were developed in the framework of the TEMI-project.

Chair: Bremen University
Target group: teachers, teachers' trainers, researchers, informal learning community
Format: hands-on activity
Main TEMI theme: mysteries, inquiry based science education

Workshop #4.3 (also #3.2) How magicians fool our brains. What a teacher can learn from a magician

Medical student and performer of Theatrical Magic, Kristine Hjulstad, explains how she uses magic tricks to illustrate the strengths and weaknesses of human perception. For three years Kristine has travelled with her performance "Hjerne det"! ("The Brain") entertaining and teaching pupils age 8-12 principles of neuro physiology and conjuring. The workshop will discuss what teachers can learn from a magician and bring back in the classroom.

Chair: University College of Southeast Norway
Target group: teachers
Format: hands-on activity
Main TEMI theme: showmanship

Workshop #4.6 (also #2.5) The circus of mysteries

The workshop will consist of a circus of 6-8 mysteries. The teachers will work in groups of 2 or 3 and briefly try out each mystery (45 minutes). In their groups they will then choose one mystery and discuss how to turn it into a lesson using a simple template based on the 5E model (20 minutes). Each group will then report briefly on how they would develop their mystery, and how it would fit into their school science curriculum. Ideas for using showmanship in relation to the mysteries will be discussed.

Chair: University of Limerick
Target group: teachers
Format: hands-on activity
Main TEMI theme: mysteries

SESSION 5 / 11.00 - 12.30

Workshop #5.1 (also #1.1) **Worst scenarios: an inquiry into science education projects nightmares - "It could be worse. It could be raining."**

Once upon a time... in a rare land called Europium, there was an innovative science education project and a smart policy for science education. It had a wonderful international team of long time experts, was tackling a catchy topic and funds to go on for several years. What could possibly go wrong?

Come and imagine the rest of the story and the worst possible scenarios for an innovative science education project. In small groups, reflecting on real cases and using their experience and creativity, participants will identify disrupting elements that can punctuate the life of a project. They will then share their story with the whole group. By the end of the workshop, participants will have generated a list of risks and a precious analysis of potential obstacles to be aware of for future projects and policies they might lead.

Chair: Traces
Target group: policymakers, researchers
Format: interactive session
Main TEMI theme: policies

Workshop #5.4 (also #5.5) **From the magic of science to the science of magic**

The Periodic Table of the Elements (PTE) is used on stage for recreational science and for magic performance. The dual characteristic of the PTE -a collection of numbers and a collection of one- or two-letter symbols- allows for adaptation of classical magic games and also to create new ones. Miquel Duran and Fernando Blasco - respectively chemistry and mathematics professors at the Polytechnics University, Madrid and the University of Girona - show a collection of fun, entertaining, and educating activities on PTE. The complement mathematical magic with spectacular, fast chemistry experiments - humour and audience participation is indeed a key performing issue.

Chair: SterrenLab
Target group: teachers, teachers' trainers, informal learning community
Format: interactive session
Main TEMI theme: showmanship

Workshop #5.2 (also #1.2) **The student experience of TEMI**

This session will be a hands-on interactive opportunity for delegates to experience the four innovations of TEMI through several authentic teaching scenarios. By experiencing the activities from the perspective of students, delegates will gain an appreciation of how the TEMI approach is intended to work in the classroom. Delegates will be able to see student and teacher materials for different activities developed by Sheffield Hallam University.

Chair: Sheffield Hallam University
Target group: teachers, teachers' trainers, policymakers, researchers, informal learning community

Workshop #5.5 (also #2.4) **Discovering the 5Es using indicators**

The workshop focuses on the 5E instructional model and its different phases. The participants have the chance to experience three phases (Engage, Explore, Explain) by themselves and will be inspired by the workshop leaders for the other two phases (Elaborate, Evaluate).

The activities during the workshop are based on the mystery "The (un)reliable indicator". The participants will discover and discuss this mystery and the workshop leaders will support them to explain the chemical background on different levels. Furthermore, there will be suggestions for different possibilities to create the Elaborate-phase and hints on aspects to Evaluate.

Chair: University of Vienna
Target group: teachers, teachers' trainers, policymakers
Format: hands-on activity
Main TEMI theme: 5E

Workshop #5.3 (also #3.4) **Make your own mystery videos with tablet PCs or smartphones**

More and more schools have access to tablet PCs, nearly every student has now a smartphone. Why not to use these devices to make your own mystery videos for use in class or for uploading them on YouTube. The workshop presents easy ways to make experimental videos with handheld devices. The participants can try them out and create their own small videos of some mystery experiments.

Chair: University of Bremen
Target group: teachers, teachers' trainers
Format: interactive session
Main TEMI theme: mysteries, inquiry based science learning

Workshop #5.6 (also #1.5) **See the atom, touch the atom!**

The topic nanotechnology is a well known issue associated with discoveries of practical application. Although it is not reflected in national curricula, it can be an attractive theme for students who see the result of natural science research. Can you imagine how small "nanoworld" is? How could we visualize it? Is it possible to touch nanoparticles? The participants of the workshop will get to know what is nano, they will play a game on nano, see some demonstrations on scanning probe microscopy (SPM) and also see the tiniest film ever, "A boy and his atom".

Chair: Charles University
Target group: teachers, teachers' trainers, policymakers
Format: hands-on activity
Main TEMI theme: mysteries, policies

Sunday, April 17

Scheltema - Marksteeg 1

12.30 - 13.30

CLOSING REMARKS

Peter McOwan, coordinator of the TEMI project, and Matt Parker, mathematician, stand up comedian and presenter of the congress, will wrap up the congress highlighting the main issues emerged during the event and the outcomes of the workshop discussions. The talk will involve the delegates and present the legacy of the TEMI project.

GRAND FINALE 'A SLAVE OF THE TRUTH' - STAGE ACT

An Oxford-trained philosopher, 'a slave of the truth', Tilman Andris will have you doubt your senses when he assumes the role of deceiver and magician, using nothing but two cups, a couple of balls, some metal rings and a piece of rope. Where conjuring, theatre and storytelling meet, Tilman Andris has found a form for the presentation of classical illusions that will have you look at old tricks with new eyes. Maarten Doorman, art critic for De Volkskrant, wrote about this act: "Whoever thinks that he knows what he sees and that things are as they seem should watch a performance by magician Tilman Andris. He will be dumbfounded. No cheap amusement here, but a feeling of astonishment that will stay with you for a long time to come." An opportunity to see the magician's presentation techniques in action and what a teacher can learn from it.

13.30 - 14.30

LIGHT OR PACKED LUNCH

Teaching the TEMI way



Congress

April 15-17, 2016

Leiden, The Netherlands

*See you all
in Leiden.*

For all enquiries, please contact
Cristina Olivotto
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