# PROGRAMME

SCIENTIX
The community for science education in Europe

# 2nd Scientix Conference

BRUSSELS
24-26
OCTOBER
2014

The work presented in this document / workshop is supported by the European Commission's FP7 programme – project Scientix 2 (Grant agreement N. 337250), coordinated by European Schoolnet (EUN). The content of the document/workshop is the sole responsibility of the organizer and it does not represent the opinion of the European Commission, and the Commission is not responsible for any use that might be made of information contained.

SCIENTIX
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# PROGRAMME

## Friday 24 October 2014

| Time | Type | Room: Ballroom |
|---|---|---|
| 16:00-18:00 | **Registration** | |
| 18:15-19:00 | **Conference Opening** | **Marc Durando**, Executive Director, European Schoolnet, BE<br>"Welcome to conference" |
| | | **Video Message from Commissioner Màire Geoghegan-Quinn, DG Research and Innovation, European Commission, BE** |
| | | *Keynote speech*: **Prof. Mariano Gago,** Former Minister of Portugal, in charge of Science and Technology, Information Society and Higher Education<br>"How should Ministries of Education take up STEM challenges?" |
| 19:00-21:00 | **Networking Reception: Welcome to Scientix, the Community for Science Education in Europe** *(Ballroom)* | |

## Saturday 25 October 2014

| Time | Type | Room: Ballroom |
|---|---|---|
| 9:00-9:10 | **Plenary session 1** | **Dr Àgueda Gras-Velázquez**, Scientix Project Manager, Science Programme Manager at European Schoolnet, BE<br>"Introduction to Scientix and the conference" |
| 9:15-9:50 (30'+5') | | *Keynote speech*: **Ewald Breunesse,** Manager Energy Transitions, Shell Nederland, Member of the Board of Directors at Shell Nederland Pensioenfonds Stichting<br>"How to make STEM teaching more attractive to students" |
| 9:55-10:30 (30'+5') | | *Keynote speech*: **Amber S. Gell,** Rocket Scientist & Spacecraft Systems Engineer, Lockheed Martin – NASA, Orion Program<br>"Making it as a Scientist and Engineer" |
| 10:30-11:00 | Coffee Break / Posters and exhibitions session | |
| 11:00-12:30 | **Plenary session 2** | **EU projects for teachers:** 3' presentation to stands from 25 EC-funded STEM projects. **Moderated by Dr Maria Korda**, European Commission |
| | | 1 Mascil<br>2 Make the Link<br>3 GEOschools<br>4 Metafora<br>5 ICT for IST<br>6 ENGINEER<br>7 NanoDiode<br>8 nanOpinion<br>9 PLACES<br>10 TEMI<br>11 CyberMentor<br>12 Inspiring Science Education |
| | | 13 Science on Stage Europe<br>14 eTwinning<br>15 SAILS, ASSIST-ME, FaSMEd<br>16 Go-Lab<br>17 e-Bug<br>18 PROFILES<br>19 REStARTS<br>20 SUSTAIN<br>21 Xplore Health<br>22 inGenious<br>23 Scientix<br>24 Science: It's a girl thing<br>25 Responsible Research and Innovation |
| 12:30-13:45 | Lunch / Posters and exhibitions session | |

| Saturday 25 October 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parallel sessions I: 13:45 – 15:15 (90') // Each talk: 15'+5'(Q&A) // 20' x 4 = 80'** | | | | | | | |
| **Rooms** | **Ballroom I** | **Ballroom II** | **Klimt** | **Vision** | **Clarity** | **Serenity** | **Infinity** |
| **13:45** | **1. Curriculum innovations** | **2. School projects** | **3. Research and schools** | **4. Tools and schools** | **5. The world around us** | **13:45 – 14:25 (40')** | |
| 13:50 | 1.1 *Education for sustainable development through inquiry (T01)* | 2.1 *Creativity in teaching science (T11)* | 3.1 *ICRC ACADEMY-Academy (T24)* | 4.1 *Walking in Galileo's footsteps with digital shoes (T48)* | 5.1 *Geo-sciences serious game: a path in a volcanic area (T08)* | **Workshop A.I** *Use of Augmented Reality (AR) in education (WS01)* | **13:45 – 14:25 (40') Workshop B.I** *Exploring online labs with visually impaired students (WS03)* |
| 14:11 | 1.2 *Living biological systems at school (T33)* | 2.2 *Teaching science in Spain (in English!) (T46)* | 3.2 *Posters as educational material for science education (T38)* | 4.2 *The use of the GLOBE Programme in education (T55)* | 5.2 *Teachers learning about climate change education (T41)* | | |
| 14:32 | 1.3 *INSTEM - innovation network in STEM (T23)* | 2.3 *The alga who wanted to be a flower (T53)* | 3.3 *Learning science In the 21st century (T43)* | 4.3 *PLE -supporting personal STEM learning (T69)* | 5.3 *A new approach for teaching data and statistics (T27)* | **14:35 – 15:15 (40')** | |
| 14:53 | 1.4 *Billion Oyster Project: Curricular innovations in STEM (T67)* | 2.4 *Robots in STEM education (T02)* | 3.4 *GenPORT: an Internet portal for sharing knowledge and inspiring collaborative action on gender and science (T70)* | 4.4 *Chasing Aurora: Using authentic context for STEM (T21)* | 5.4 *European Space Education Resource Office (T36)* | **Workshop A.II** *Promoting language skills in primary school (WS02)* | **Workshop B.II** *Zondle – ICT game-based learning (WS05)* |
| **15:15** | Coffee Break / Posters and exhibitions session | | | | | | |

## Saturday 25 October 2014

**Parallel sessions II: 15:45 – 17:15 (90') // Each talk: 15'+5'(Q&A) // 20' x 4 = 80'**

| Rooms | Ballroom I | Ballroom II | Klimt | Vision | Clarity | Serenity | Infinity |
|---|---|---|---|---|---|---|---|
| **15:45** | **6. Projects I** | **7. Projects II** | **8. From early ages to long distances** | **9. Energy, engineering and nano-technology** | **10. National projects** | **15:45 – 16:25 (40')** | |
| | | | | | | **Workshop C.I** *Sparkling IBSE: Humming-bird seeks Bromeliad (WS07)* | **Workshop D.I** *Outdoor challenges (WS06)* |
| 15:50 | 6.1 *Motivating teacher and student science learning (T28)* | 7.1 *Opening science to school students - 10 years on (T05)* | 8.1 *Enabling creativity and inquiry in early years (T50)* | 9.1 *STE&M intertwined - Learning by analogy (T06)* | 10.1 *Didactic method helping to obtain com-prehension (T22)* | | |
| 16:11 | 6.2 *Towards a ubiquitous good NST education (T51)* | 7.2 *Bringing space exploration to a classroom near you (T64)* | 8.2 *Teaching statistics in primary school. (T14)* | 9.2 *The Green Agents Mission (T13)* | 10.2 *IBL for raising students' attraction to science (T59)* | | |
| 16:32 | 6.3 *Quantum spin-off (T52)* | 7.3 *CREAT-IT: Implementing creative strategies in science teaching (T49)* | 8.3 *How research teaching of cycles and symmetries of Sun movements and the Sun/Earth model affects knowledge and attitudes of pre-service primary teachers (T35)* | 9.3 *From NanoYou to Secondary School Nano Studies (T47)* | 10.3 *Promoting excellence in STEM education (T60)* | **16:35 – 17:15 (40')** | |
| | | | | | | **Workshop C.II** *BioDan-sciences Project – Part 1 and Part 2 Workshop (WS12)* | **Workshop D.II** *The mass of an astronaut in zero gravity (WS09)* |
| 16:53 | 6.4 *Responsible Research and Innovation, a new paradigm in Horizon 2020 (T63)* | 7.4 *PARRISE: integrating society in science education (T66)* | 8.4 *The Future Project: A new cooperation (T26)* | 9.4 *Aquaponics in classrooms as a tool to promote system thinking (T62)* | 10.4 *The Cell EX-PLORERS programme (T20)* | | |
| **17:15-19:00** | **Posters and exhibitions session** | | | | | | |
| **19:00-20:30** | Free time (walk around Brussels recommended) | | | | | | |
| **20:30-22:30** | Networking dinner: **Science education in Europe – what got you interested in STEM?** *(Ballroom)* | | | | | | |

| Sunday 26 October 2014 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parallel sessions III: 9:00 – 10:30 (90') // Each talk: 15'+5'(Q&A) // 20' x 4 = 80'** | | | | | | | |
| | **Ballroom I** | **Ballroom II** | **Klimt** | **Vision** | **Clarity** | **Serenity** | **Infinity** |
| **09:00** | **11. Role models and good examples** | **12. IBSME** | **13. Projects III** | **14. Teacher training, continuous learning and assessment** | **15. Science and social inclusion** | **09:00 – 09:40 (40')** | |
| | | | | | | **Workshop E.I** *Learning Maths through new communication factors (WS10)* | **Workshop F.I** *Imagine... Science for your future (WS13)* |
| 09:05 | 11.1 *Meet the Scientist (T18)* | 12.1 *Science Demonstrations As A Tool For Inquiry-based (T03)* | 13.1 *COMBLAB (T54)* | 14.1 *Promotion of science vertically: Kindergarten - Primary School - Gymnasium (T07)* | 15.1 *Listening and empowering children (T65)* | | |
| 09:26 | 11.2 *It's my choice - women in STEM Studies (T19)* | 12.2 *Inquiry-based learning in physics and maths classes (T10)* | 13.2 *ASTEP and professional development (T56)* | 14.2 *Teacher education by science centre pedagogy (T45)* | 15.2 *Targeting activities for under-represented groups (T65)* | | |
| 09:47 | 11.3 *How To Use Participatory Action Research to foster inquiry-based learning in science education (T32)* | 12.3 *Sustainable inquiry-based science learning: optimising the student knowledge / teacher fatigue ratio. (T30)* | 13.3 *DynaLearn (T61)* | 14.3 *Strategies for Assessment of Inquiry Learning in Science (SAILS) (T72)* | 15.3 *Ethics of working with children and students (T65)* | **09:50 – 10:30 (40')** | |
| | | | | | | **Workshop E.II** *Learn maths through code (WS11)* | **Workshop F.II** *Gender in STEM education (WS14)* |
| 10:08 | 11.4 *Fostering innovation in STEM education (T15)* | 12.4 *Fibonacci in Spain (T58)* | 13.4 *School on the Cloud: lessons from Digital Earth (T17)* | 14.4 *ASSIST-ME: Assess inquiry in science, technology and mathematics education (T73)* | 15.4 *Implications of delivering science and social inclusion activities (T65)* | | |
| **10:30** | Coffee Break / Posters and exhibitions session | | | | | | |

## Sunday 26 October 2014

**Parallel sessions IV: 11:00 – 12:30 (90') // Each talk: 15'+5'(Q&A) // 20' x 4 = 80'**

| | Ballroom I | Ballroom II | Klimt | Vision | Clarity | Serenity | Infinity |
|---|---|---|---|---|---|---|---|
| **11:00** | **16. Coding in STEM** | **17. Out of school learning** | **18. Mobiles and games** | **19. Competence learning and motivation** | **20. Remote and digital** | **11:00 – 11:40 (40')** | |
| | | | | | | **Workshop G.I** *Real-time experiments for the acquisition of science competencies: COMBLAB project (WS04)* | **Workshop H.I** *Scientix and elevator pitches (WS08)* |
| 11:05 | 16.1 *Computer programming and coding skills in national, regional or school curricula (T68)* | 17.1 *Science Camps in Europe (T12)* | 18.1 *Mobile Learning: Go for it! (T39)* | 19.1 *A crossed approach for a competence-based learning (T29)* | 20.1 *Remote experiments about bioclimatic architecture (T31)* | | |
| 11:26 | 16.2 *Programming Creative Games in Estonia (T71)* | 17.2 *Science on European School Radio (T57)* | 18.2 *STEM for all: Developmental & game-based approach (T40)* | 19.2 *Improving students' motivation in learning physics (T44)* | 20.2 *Science Learning: the analogue versus The digital (T42)* | | |
| 11:46 | Change of rooms | | | | | | |
| **11:50 – 12: 30 (40')** | **Round Table (RT7)** *Science education and gender as part of RRI* | **Round Table (RT3)** *Quality standards on educational resources* | **Round Table (RT5)** *School - industry collaboration* | **Round Table (RT6)** *Science fairs and competitions* | **Round Table (RT2)** *Mindcrawler* | **Round Table (RT4)** *Informal learning, science centres, museums and cafes* | **Round Table (RT1)** *There is a world outside to discover through IBL with 4elements* |
| **12:30** | Lunch / Posters and exhibitions session | | | | | | |

## Sunday 26 October 2014

| Time | Type | Room: Ballroom |
|---|---|---|
| **13:45 – 14:30** | **Conference closing** | **1st Scientix resources awards, Poster competition awards and Scientix conference Twitter awards** |
| **14:30 - 14:45** | | **Dr Maria Korda**, Policy Officer DG Research & Innovation of the European Commission, BE<br>"Scientix and the collaboration between the EC and EUN" |
| **14:45 - 15:15** | | **Marc Durando**, Executive Director, European Schoolnet, BE<br>"It's really all up to the teachers" |
| **15:15 – 15:30** | | **Dr Àgueda Gras-Velázquez**, BE<br>"Thank you and goodbye" |

## Rooms

Location of the different rooms:

| Room | Location | Maximum occupancy |
|---|---|---|
| **Ballroom** | Ground floor | 650 |
| **Ballroom I** | Ground floor | 150 |
| **Ballroom II** | Ground floor | 150 |
| **Klimt** | Ground floor, in front of the hotel reception | 130 |
| **Vision** | 8th floor | 130 |
| **Clarity** | 8th floor | 70 |
| **Serenity** | 2nd floor | 35 |
| **Infinity** | 2nd floor | 35 |
| **Posters exhibition** | Ground floor (Arabesque, Stoclet, Mosaic rooms) | |
| **Stands exhibition** | 1st floor | |

## Lunches

Lunch will be served in three different locations. Your badge indicates which restaurant you have been allocated to:

| Colour | Restaurant |
|---|---|
| **Blue** | Crowne Plaza Restaurant |
| **Yellow** | Hilton Hotel |
| **Red** | Sheraton Hotel (30th floor) |

Scientix Ambassadors and Deputy Ambassadors will help you get to the correct restaurant.

## Posters

| Id | Title | Last Name | First Name |
|---|---|---|---|
| **P01** | How much rain must fall to make the school collapse? | Ambrosi | Daniela |
| **P02** | New methodologies for science learning. | Perez Perez | Juan Manuel |
| **P03** | GPS & meteorological science in forest protection | Costa | Manuela |
| **P04** | Fieldwork in earth sciences (geography) | Dembowska | Zofia |
| **P05** | Nature or Highway? - Enhancement of biodiversity in an IBSE school project | Henning | Kevin |
| **P06** | Frog – maths competition | Etelka | Volter |
| **P07** | "Solarmobil" – a challenge for European students? | Haas | Jörg |
| **P08** | Wondrous transformation | Karova | Pavlina |
| **P09** | eTwinning project: our colourful world | Koziori | Barbara |
| **P10** | Amgen Teach: inquiry-based training workshops on life sciences | Leontaraki | Ioanna |
| **P11** | Implementation and development of English language | Labas Horvat | Maja |
| **P12** | Following Eratosthenes' steps | Kypriotis | Eugenia |
| **P13** | Nano within high school physics: Nanolab project | Lisotti | Annamaria |
| **P14** | Social media doesn't have to be scary | Luna | Fiona |
| **P15** | Building a simple mobile game | Bossolasco | Secondino |
| **P16** | Matheatre – learning maths using theatre activities | Maris | Adriana |
| **P17** | The use of quizlets in science education | O'Leary | Michael |

| Id | Title | Last Name | First Name |
|---|---|---|---|
| **P18** | Making compost at school | Poncela | Elena |
| **P19** | Implementing local natural resources in research | Rasan | Miso |
| **P20** | Using fiction In learning and teaching chemistry | Saar | Martin |
| **P21** | Learning about space (science education) | Sahin | Suat |
| **P22** | Analysis of cognitive levels of students' learning | Sumpor | Dalibor |
| **P23** | Bridging the new IT generation with Grandma's games | Vasileva | Marina |
| **P24** | Lyps – a successful eTwinning project | Vladescu | Constantin Lucian |
| **P25** | What we breathe and where it comes from | Yotova | Galina |

## Workshops

| ID | Title | Last Name | First Name | Session |
|---|---|---|---|---|
| **WS01** | Use of Augmented Reality (AR) in education | Aguirre Molina | Daniel | A.I |
| **WS02** | Promoting language skills in primary school | Breuer-Küppers | Petra | A.II |
| **WS03** | Exploring online labs with visually impaired students | Canas | Lina | B.I |
| **WS04** | Real-time experiments for the acquisition of science competencies: COMBLAB project | Guitart | Fina | G.I |
| **WS05** | Zondle – ICT game-based learning | Derek | Bosiljko | B.II |
| **WS06** | Outdoor challenges | Ekblad | Anna | D.I |
| **WS07** | Sparkling IBSE: Hummingbird seeks Bromeliad | Eilers | Sonja | C.I |
| **WS08** | Scientix and elevator pitches | Gulič | Tatjana | H.I |
| **WS09** | The mass of an astronaut in zero gravity | Lambert | Dominique | D.II |
| **WS10** | Learning maths through new communication factors | Makrides | Gregoris | E.I |
| **WS11** | Learn maths through code | Urschitz | Tullia | E.II |
| **WS12** | BioDansciences Project – Part 1 and Part 2 Workshop | Valenzuela Zapata | Ana Guadalupe | C.II |
| **WS13** | Imagine... Science for your future | Van Den Berg | Lotte | F.I |
| **WS14** | Gender in STEM education | Tripepi | Chiara | F.II |

## Presentations

| ID | Title | Last Name | First Name | Session |
|---|---|---|---|---|
| **T01** | Education for sustainable development through inquiry | Aceska | Natalija | 1.1 |
| **T02** | Karelino – a robot for stem education | Agape | Mihai | 2.4 |
| **T03** | Science demonstrations as a tool for inquiry-based learning | Nugent | Paul | 12.1 |
| **T05** | Opening science to school students – 10 years on | Barton | Anna | 7.1 |
| **T06** | STE&M intertwined – learning by analogy | Ben-Horin | Yair | 9.1 |
| **T07** | Promotion of science vertically | Bohinc Zaveljcina | Natalija | 14.1 |
| **T08** | Geosciences serious game: a path in a volcanic area | Boniello | Annalisa | 5.1 |
| **T10** | Inquiry-based learning in physics and maths classes | Bronner | Patrick | 12.2 |
| **T11** | Creativity in teaching science | Bulat | Sanja | 2.1 |
| **T12** | Science Camps in Europe | Chaves | Susana | 17.1 |

| ID | Title | Last Name | First Name | Session |
|---|---|---|---|---|
| **T13** | The Green Agents Mission | Christodoulou | Anna | 9.2 |
| **T14** | Teaching statistics in primary school | Da Valle | Silvia | 8.2 |
| **T15** | Fostering innovation in STEM education | Debry | Maite | 11.4 |
| **T17** | School on the cloud: lessons from Digital Earth | Donert | Karl | 13.4 |
| **T18** | Meet the scientist | Antos | László | 11.1 |
| **T19** | It's my choice – women in stem studies | Elster | Doris | 11.2 |
| **T20** | The cell EXPLORERS programme | Grenon | Muriel | 10.4 |
| **T21** | Chasing Aurora: using authentic context for stem | Hechter | Richard | 4.4 |
| **T22** | Didactic method helping to obtain comprehension | Heidingers | Uldis | 10.1 |
| **T23** | Instem – innovation network in stem | Insenga | Michela | 1.3 |
| **T24** | ICRC academy | Povolna | Zuzana | 3.1 |
| **T26** | The Future Project: a new cooperation | Kennett | Roger | 8.4 |
| **T27** | A new approach for teaching data and statistics | Kikas | Ülle | 5.3 |
| **T28** | Motivating teacher and student science learning | Kyza | Eleni | 6.1 |
| **T29** | A crossed approach for a competence-based learning | Tramonti | Michela | 19.1 |
| **T30** | Sustainable inquiry-based science learning | Lombard | François | 12.3 |
| **T31** | Remote experiments about bioclimatic architecture | Maidou | Anthoula | 20.1 |
| **T32** | How to use Participatory Action Research To foster inquiry-based learning in science education | Majer | Anna | 11.3 |
| **T33** | Living biological systems at school | Mazzanti | Claudia Maria | 1.2 |
| **T35** | How research teaching of cycles and symmetries of Sun movements and the Sun/Earth model affects knowledge and attitudes of pre-service primary teachers | Menargues Marcilla | Asuncion | 8.3 |
| **T36** | European Space Education Resource Office | Mestdagh | Pieter | 5.4 |
| **T38** | Posters as educational material for science (Special Education) | Nerantzis | Nikolaos | 3.2 |
| **T39** | Mobile learning: Go For It! | Nikou | Stavros | 18.1 |
| **T40** | STEM for all: developmental & game-based approach | Nousiainen | Tuula | 18.2 |
| **T41** | Teachers learning about climate change education | Oversby | John | 5.2 |
| **T42** | Science learning: the analogue versus the digital | Pathmanathan | Sai | 20.2 |
| **T43** | Learning science In the 21st century | Pinto | Tania | 3.3 |
| **T44** | Towards the improvement of students' motivation in learning physics | Poposka | Marina | 19.2 |
| **T45** | Teacher education by Science Centre pedagogy | Salmi | Hannu | 14.2 |
| **T46** | Teaching science in Spain (in English!) | Sanz Duran | Alicia | 2.2 |
| **T47** | From NanoYou to secondary school Nano studies | Shimoni-Ayal | Nira | 9.3 |
| **T48** | Walking In Galileo's footsteps with digital shoes | Siccardi | Matteo | 4.1 |
| **T49** | Implementing creative strategies in science teaching | Sotiriou | Menelaos | 7.3 |
| **T50** | Enabling creativity and inquiry In early years | Stylianidou | Fani | 8.1 |
| **T51** | Towards a ubiquitous good NST education | Talesnik | Moshe | 6.2 |
| **T52** | Quantum spin-off | Tamassia | Laura | 6.3 |

| ID | Title | Last Name | First Name | Session |
|---|---|---|---|---|
| **T53** | The alga who wanted to be a flower | Tavares | Ana Cristina | 2.3 |
| **T54** | COMBLAB | Tortosa | Montserrat | 13.1 |
| **T55** | The use of the GLOBE programme in education | Tóth | Piroska | 4.2 |
| **T56** | ASTEP and professional development | Touchard | Evelyne | 13.2 |
| **T57** | Science on European School Radio | Touliou | Eftychia | 17.2 |
| **T58** | Uptake of Fibonacci in Spain | Trompeta | Antonia | 12.4 |
| **T59** | IBL for raising students' attraction to science | Ugolini | Francesca | 10.2 |
| **T60** | Promoting excellence in STEM education | Van Bruggen | Andrea | 10.3 |
| **T61** | Dynalearn | Bredeweg | Bert | 13.3 |
| **T62** | Aquaponics in classrooms as a tool to promote system thinking | Junge | Ranka | 9.4 |
| **T63** | Responsible Research and Innovation, a new paradigm In Horizon 2020 | Malagrida | Rosina | 6.4 |
| **T64** | Bringing space exploration to a classroom near you | Caldwell | Val | 7.2 |
| **T65** | Listening and empowering children | Mignan | Vanessa | 15.1 |
| **T65** | Targeting activities for under-represented groups | Baboeram-Mahes | Pravini | 15.2 |
| **T65** | Ethics of working with children and students | Parder | Mari-Liisa | 15.3 |
| **T65** | Implications of delivering science and social inclusion activities | Jenkins | Tricia | 15.4 |
| **T66** | PARRISE: Integrating society in science education | Levinson | Ralph | 7.4 |
| **T67** | Billion Oyster Project: Curricular innovations In STEM | Birney | Lauren | 1.4 |
| **T68** | Computer programming and coding skills in national, regional or school curricula | Engelhard | Katja | 16.1 |
| **T69** | PLE -supporting personal STEM learning | Hall'en | Elisabeth | 4.3 |
| **T70** | GenPORT: an Internet portal for sharing knowledge and inspiring collaborative action on gender and science | Müller | Jörg | 3.4 |
| **T71** | Programming Creative Games in Estonia | Palts | Tauno | 16.2 |
| **T72** | Strategies for Assessment of Inquiry Learning in Science (SAILS) | McLoughlin | Eilish | 14.3 |
| **T73** | ASSIST-ME: Assess inquiry in science, technology and mathematics education | Dolin | Jens | 14.4 |

# KEYNOTE SPEAKERS

## Prof. Mariano Gago

**Former Minister of Portugal, in charge of Science and Technology, Information Society and Higher Education**

Professor José Mariano Gago is an experimental high energy physicist and a Professor of Physics at the Instituto Superior Técnico (IST) in Lisbon, Portugal. He graduated as an electrical engineer from the Technical University of Lisbon and obtained a PhD in Physics from the École Polytechnique in Paris. He worked for many years as a researcher at the European Organisation for Nuclear Physics (CERN) in Geneva, Switzerland and in Portugal's Laboratory for Particle Physics (LIP), which he chaired. Prof. Gago is a member of the CERN Council. He chaired the High Level Group on Human Resources for Science and Technology in Europe.

As Minister of Science and Technology (S&T) from 1995 to 2002, Prof. Gago was responsible for science and technology and for information society policies. He launched the Ciencia Viva m vement to promote S&T culture and S&T in society. During the Portuguese EU presidency (2000) he prepared, along with the European Commission, the Lisbon Strategy for the European Research Area and for the Information Society in Europe. In 1998 he also launched the Eureka-Asia Initiative in Macao. During the 2007 Portuguese EU Presidency he promoted the adoption of a strategy for the future of S&T in Europe and for the modernisation of universities in the EU.

## Ewald Breunesse

**Manager Energy Transitions, Shell Nederland,**
**Member of the Board of Directors at Shell Nederland Pensioenfonds Stichting**

Born in 1955, Ewald has a PhD in economics from the Free University Amsterdam. He joined Shell in 1983 where he has held positions in market research, scenario planning, pension funds, electricity and currently energy transitions.

## Amber S. Gell

**Rocket Scientist & Spacecraft Systems Engineer,**
**Lockheed Martin – NASA, Orion Program**

Amber S. Gell currently works for Lockheed Martin in Houston, Texas. She has always been extremely interested in space and exploration, especially human spaceflight, which is her ultimate goal. Ms Gell is currently part of the team designing and building the Orion Spacecraft, the Multipurpose Crew Vehicle (MPCV), NASA's new spacecraft for Deep Space Exploration.

Ms Gell splits her time between "Rocket Science," numerous Education Outreach efforts, Microgravity Research, lifelong learning, and fitness activities. She is an alumna of Embry-Riddle Aeronautical University in Daytona Beach, Florida, where she received a Bachelor of Science degree in Aerospace Engineering and a second Bachelor of Science degree in Aerospace Studies, with minors in Human Factors Engineering, Psychology, and Advanced Mathematics. Ms Gell has also received a Master of Science degree in Human Performance, a Master of Engineering degree in Space Systems Engineering, a Master of Business Administration (MBA) degree, specialising in International Business, and a Master of Science degree in Finance.

# EU PROJECTS FOR TEACHERS (STANDS)

## 1. Mascil

Coordinator: **University of Education Freiburg, Germany**

Funding: **EC (FP7)**

Presenter: **Anna-Maria Aldorf**

MASCIL (2013-2016) aims to connect inquiry-based science and mathematics education (IBSE) in schools with students' future careers and increase their interest in careers in science and technology. The project develops and organises training courses for teachers and trainee teachers on IBSE in vocational contexts and with support from industry and informal learning. Some courses will also be available online on the project's e-learning platform. The courses start in the second half of 2014. The courses are complemented by materials and resources for the classroom and teacher professional development. They are available in the project's resource repository, together with notes for teachers, explaining the pedagogical approach behind each classroom resource. Other activities include information events, student contests and roundtable discussions.

Project website:
➜ http://www.mascil-project.eu

Project in the Scientix portal:
➜ http://goo.gl/Nq8ylZ

## 2. Make the link

Coordinator: **Practical Action**

Funding scheme: **EC**

Presenter: **Julie Brown, Bren Hellier**

Make the Link is a three-year EC-funded education project that started in January 2013. Carried out in four different EC countries, the project will raise young people's awareness and understanding of global issues and how their own behaviours impact the developing world.

The project will integrate global issues into science and technology curricula policy and practice in the UK, Cyprus, Poland and Italy. The material produced will focus on Technology Justice, the right of all people to have access to equipment, knowledge and skills that enable them to live a life they value without harming others now or in the future, and how this relates to the Millennium Development Goals. As a result of the project over ¾ million EC children aged 7-19 will be able to:

- Make the link between science and technology and the MDGs/poverty reduction
- Make the link between their behaviour and its impact on the developing world
- Make the link… then make a difference.

Project website:
➜ http://makethelink.eu

Project in the Scientix portal:
➜ http://bit.ly/1t0UP46

## 3. GEOschools

Coordinator: **National and Kapodistrian University of Athens, Greece**

Funding scheme: **EC (LLP)**

Presenter: **Maria Psichogiou, Fillippa Martha Christofalou**

GEOschools (2011-2013) aimed to provide advice, teaching aids, instruments and other support for teaching geoscience in secondary schools. The GEOschools project brought together geoscientists from universities, teaching training institutions, schools, museums and geoparks. The project supports innovative teaching of geosciences in secondary schools and raising awareness on geoheritage. The overall aims are:

- To bridge the gap between scientific knowledge and school knowledge in the field of geosciences
- To increase teachers' knowledge and students' interest in geosciences
- To improve the didactics of geosciences in European schools
- To promote education for sustainable development.

The project also supports school-science collaboration by bringing teachers and practising geoscientists together in a variety of activities in geoparks, geotopes and museums as well as in the classroom. The activities and materials and the GEOschools approach are regularly disseminated to teachers through the GEOschools open conferences.

Project website:
➜ http://geoschools.geol.uoa.gr/

Project in the Scientix portal:
➜ http://goo.gl/xc5vhv

## 4. Metafora

Coordinator: **The Hebrew University of Jerusalem, Israel**

Funding scheme: **EC (FP7)**

Presenter: **Reuma De-Groot, Rupert Wegerif**

Metafora aims to create a Computer-Supported Collaborative Learning system to enable students to learn science and mathematics in an effective and enjoyable way.

The project explores the potential of social learning for science and maths by providing a visual language to support online groups in designing their own learning together. Learners thus share their learning experiences with their peers in a dialogue. The tools and pedagogies being developed link two hitherto largely separate strands of educational technology research:

- computer-supported collaborative learning (CSCL) and
- learning through engagement in domain-specific learning environments.

The original contribution comes not only from the combination of these two traditions of research but also from the recognition that learning to learn (meta-learning) is an essential skill in today's society. The goals is to help learners reflect on learning mathematics and science as a social process and discover the best ways for them to structure their learning and to engage in their learning as individuals and as a community.

Project website:
➜ http://www.metafora-project.org

Project in the Scientix portal:
➜ http://goo.gl/dq7d3d

## 5. ICT for IST

Coordinator: **Centre for Informatics and Technology in Education (OEliZK), Poland**

Funding scheme: **EC (LLP)**

Presenter: **Ton Ellermeijer, Ewa Kedzierska**

ICT for IST offer new approaches to teacher training in the use of ICT in the classroom supported by the instructional material, online resources and demonstration videos.

The project is a follow-up activity to a previous project IT for US (Information Technology for Understanding Science) which produced training material for teachers to help them develop skills in using ICT in the classroom.

The aim of ICT for IST was to extend the results of IT for US, both in terms of enhancing the depth of its contents and heightening its relevance and appeal to a greater number of countries.

The training materials produced present and explain the use of different ICT tools in the classroom. Together they form the ICT for IST Pack:

- A Resource Guide for Science Teachers and Trainers
- 12 learning modules, each focusing on a specific topic in biology, chemistry or physics
- Software Resources supporting the classroom activities
- Video Resources for assisting training programmes and self-study.

Project website:
➜ http://ictforist.oeiizk.waw.pl

Project in the Scientix portal:
➜ http://goo.gl/Avbj6H

## 6. ENGINEER

Coordinator: **Bloomfield Science Museum, Israel**

Funding scheme: **EC (FP7)**

Presenter: **David Broström, Sara Calcagnini**

ENGINEER supports Europe-wide uptake of innovative methods in science teaching and provides extensive teacher training on Inquiry-Based Science Education. The project is based on the programme “Engineering is Elementary” (EiE) developed by Boston Museum of Science (BMOS) in 2003-04, which is now widely used in primary schools in the USA. Using EiE’s Engineering Design Plan model, ENGINEER aims to develop ten engineering design challenge units suitable for European educational settings. Each unit will focus on one engineering field and will use inexpensive materials for student-led design problem-solving.

Science museums lead the outreach effort, targeting science teachers, student groups and the general public. It is expected that ENGINEER training will be provided to around 1,000 teachers; school and museum activities should reach over 25,000 students.

Project website:
➜ http://www.engineer-project.eu

Project in the Scientix portal:
➜ http://goo.gl/yxsQAk

## 7. NanoDiode

Coordinator: **IVAM UVA, The Netherlands**

Funding scheme: **EC (FP7)**

Presenter: **Sonja Hartl**

The NanoDiode project (2013 – 2016) is a coordinated programme for outreach and dialogue across Europe to support the effective governance of nanotechnologies.

Building on previous experience from past nanotechnology projects (both European and national), the goal is to develop new strategies for outreach and dialogue at all levels of science policy, research and development and education.

Education in secondary schools is one of the focus areas of the project. The plan is to review and evaluate nanotechnology education in Europe and identify best practices, which will then be implemented in science classes throughout Europe.

Project website:
➜ http://www.nanodiode.eu/

Project in the Scientix portal:
➜ http://goo.gl/MQj2qC

## 8. nanOpinion

Coordinator: **Centre for Social Innovation, Austria**

Funding scheme: **EC (FP7)**

Presenter: **Alexandr Prokop, Julija Baniukevic**

Nanopinion monitors public opinions on nanotechnology and engages the general public in debate on potential risks and benefits of nanotechnologies. The specific target groups of Nanopinion are students and teachers. The consortium also aims to explore ways to connect nanotechnology subjects to school curricula and produce educational materials for teaching and learning about nanotechnology in secondary schools. At the end of the project, findings and recommendations will be reported to policy makers from different institutions including the European Commission. The public participation methodology will be made available to the public so that it can be used as a reference for future projects promoted under the new EC Framework Programme Horizon 2020, where the Commission aims to promote “Responsible Research and Innovation” counting on the participation of citizens.

Project website:
➜ http://www.nanopinion.eu

Project in the Scientix portal:
➜ http://goo.gl/Y9ZRME

## 9. PLACES

Coordinator: **Ecsite, the European network of science centres and museums, Belgium**

Funding scheme: **EC (FP7)**

Presenter: **Carole Paleco, Marzia Mazzonetto**

Developing the concept of the European City of Scientific Culture, the PLACES project facilitates cooperation between science communication institutions and local authorities.

The project focuses on developing and strengthening City Partnerships, bringing together 67 science centres, museums and festivals (each partnering with local authorities) and ten European regional networks. The partnerships provide a basis to foster interactions between science centres / museums, science festival / events and universities on one side and cities / local authorities on the other. PLACES puts emphasis on topics and issues with social relevance (e.g. environmental sustainability, ageing populations, healthcare, social security, drinking water, agriculture, biodiversity, transportation, clean energy, education policies, innovation for economic growth) which allow citizens to engage in dialogue with researchers and local authorities.

Project website:
➜ http://www.openplaces.eu

Project in the Scientix portal:
➜ http://goo.gl/x9pBkt

## 10. TEMI

Coordinator: **Queen Mary, University of London, UK**

Funding scheme: **EC (FP7)**

Presenter: **Ran Peleg, Meriem Fresson**

The project (2013-2016) introduces inquiry-based learning (IBS) into the science and mathematics classroom using magic tricks, myths and mysteries.

TEMI is a teacher training project, working with teacher training institutions and teacher networks across Europe to implement innovative training programmes – nquiry labs. The Enquiry labs are based around the core scientific concepts, but use local myths and mysteries to explain them. The labs are supported by scientists and communication experts to guide teachers through the transition to use nquiry in science teaching. The TEMI Central hub coordinates the activities of the local training centres and provides a platform to share best practice across all aspects of the project.

Project website:
➜ http://www.teachingmysteries.eu/

Project in the Scientix portal:
➜ http://goo.gl/Arf5Sa

## 11. CyberMentor

Coordinator: **Universitäten Regensburg und Erlangen-Nürnberg, Germany**

Funding scheme: **National**

Presenter: **Marold Reutlinger**

www.cybermentor.de

CyberMentor is an e-mentoring programme for girls and young women ages 12–18 in Germany designed to foster their participation in science, technology, engineering, and mathematics (STEM). Each female student (mentee) is paired with a professional woman in STEM, i.e. a researcher, a professor, or an engineer, (mentor) who informs and advises her. CyberMentor offers an online platform which provides communication possibilities and helpful suggestions for STEM activities and information on STEM courses of study and professions. Community members can introduce themselves through personal pages and interact regularly via e-mail, chat, or discussion forum for the period of one year with their mentoring partner and with all programme participants. Discussion topics range from specific scientific questions about the mentors' work to private matters. Each year, at least 800 girls and 800 women take part in the programme. Having so many other students and mentors as contact persons offers a great possibility for information exchange. In order to encourage engagement within the platform, the CyberMentor management team regularly makes suggestions for STEM-related experiments, activities, and competitions that participants can work on together. CyberMentor edits a monthly journal, CyberNews, which offers reports on interesting STEM articles, quizzes, and interviews with professionals in the STEM-Field.

Project website:
➜ https://www.cybermentor.de/

Project in the Scientix portal:
➜ http://bit.ly/1t0UQoO

## 12. Inspiring Science Education

Coordinator: **INTRASOFT International, Luxembourg**

Funding scheme: **EC (FP7)**

Presenter: **Sally Reynolds, Carlos Santos**

inspiring SCIENCE education

Inspiring Science Education is a project aimed at providing resources and opportunities for teachers to make science more attractive to their students. The project includes:

– an online portal that provides an interactive inventory of e-learning tools and resources from research centres and other facilities;
– communities of practice as the place where the collaboration between teachers and students will take place.

The project will be implemented through pilot activities that will take place in 5.000 primary and secondary schools in 15 European countries. The schools will be selected to participate in piloting the project tools and resources through case studies developed in cooperation with the local teachers.

Project website:
➜ http://www.inspiringscience.eu

Project in the Scientix portal:
➜ http://goo.gl/GiOS3M

## 13. Science on Stage Europe

Coordinator: **Science on Stage Deutschland e.V., Germany**

Funding scheme: **EC (FP6)**

Presenter: **Johanna Schulze**

Science on Stage is a European initiative designed to encourage teachers from across Europe to share good practice in science teaching.

Innovative and inspirational science teaching is seen as a key factor in attracting young people to deal with scientific issues, whether or not they finally choose a career in science. Hence, Science on Stage aims to stimulate the interest of young people through their school teachers, who can play a key role in reversing the trend of falling interest in science and current scientific research. Ultimately, the aim of Science on Stage is to enable teachers to deliver science in a more creative and engaging way.

Project website:
→ http://www.science-on-stage.eu/

Project in the Scientix portal:
→ http://goo.gl/3i4Gor

## 14. eTwinning

Coordinator: **European Schoolnet, Belgium**

Funding scheme: **EC (LLP)**

Presenter: **Maite Debry**

The eTwinning community for schools provides teachers across Europe with the opportunity and the tools for collaboration in maths, science and technology education projects.

eTwinning promotes collaboration between schools in Europe through the use of Information and Communication Technologies (ICT). The community provides support, tools and services to make it easy for schools to form short- or long-term partnerships in any subject area, and thus to improve and develop teachers' practices and education in Europe. Additionally, eTwinning provides Professional Development Workshops and Learning Events where teachers can learn more about eTwinning and develop their skills in using ICT in teaching.

Project website:
→ http://www.etwinning.net

Project in the Scientix portal:
→ http://goo.gl/dqjcc8

## 15. SAILS, ASSIST-ME, FaSMed

Coordinator: **Dublin City University, Ireland - University of Copenhagen, Denmark - University of Newcastle Upon Tyne, UK**

Funding scheme: **EC (FP7)**

Presenter: **Joasia van Kooten, Jens Dolin**

The objective of SAILS is to support teachers in adopting an Inquiry-Based Science Education (IBSE) approach at secondary level (students aged 12-18) across Europe. This will be achieved by utilising existing resources and models for teacher training in IBSE for both pre-service and in-service. The project also focuses on developing appropriate strategies and frameworks for the assessment of IBSE skills and competences and preparing teachers not only to be able to take up IBSE practice, but also to be confident and competent in the assessment of their students' learning.

The overall aim of ASSIST-ME is to provide a research base on effective uptake of formative and summative assessment for inquiry-based, competence-oriented Science, Technology and Mathematics (STM) education in primary and secondary education in different educational contexts in Europe and to use this research base to give policy makers and other stakeholders guidelines for ensuring that assessment enhances learning in STM education.

FaSMEd is focused on discovering how, working with partners and researchers across different countries, educational professionals can use technology in formative assessment to help raise student attainment levels. The ultimate goal is to help improve mathematics and science skills in Europe and South Africa. In each country researchers will be working with a cluster of schools with a focus on the use of formative assessment and technology to improve interactions in the classroom and reduce the anxiety about performance which frequently limits learners' development in these subjects.

Project website:
- ➜ http://www.sails-project.eu
- ➜ http://assistme.ku.dk/
- ➜ http://research.ncl.ac.uk/fasmed/

Project in the Scientix portal:
- ➜ http://goo.gl/wYFjqR
- ➜ http://goo.gl/QjJwz7
- ➜ http://goo.gl/IYnSpq

## 16. Go-Lab

Coordinator: **University of Twente, Netherlands**

Funding scheme: **EC (FP7)**

Presenter: **Diana Dikke, Fraser Lewis**

Go-Lab (2012-2016) has created an infrastructure (the Go-Lab Portal) to provide access to online laboratories run by research centres and universities worldwide. These online labs can be used by universities, schools, instructors, students and lifelong learners to extend regular learning activities with scientific experiments, giving students a real experience of research work. The Go-Lab Project offers a federation of remote laboratories, virtual experiments, and data-sets (together referred to as "online labs"), as well as facilities for teachers to embed these online labs in pedagogically structured learning spaces.

Project website:
- ➜ http://www.go-lab-project.eu

Project in the Scientix portal:
- ➜ http://goo.gl/D3WKSV

## 17. E-Bug

Coordinator: **Health Protection Agency (HPA) Primary Care Unit, UK**

Funding scheme: **EC (DG SANCO)**

Presenter: **Beverley Hoekstra, Matthew Richter**

e-Bug is a free educational resource repository that makes learning about micro-organisms, antibiotics and hygiene fun and easy.

e-Bug helps to teach children about the different types of microbes, the activity of antibiotics against them, and the increasing problems of antibiotic resistance with unnecessary use, and thus to raise awareness of wise antibiotic use.

The e-Bug project aims to

- Reduce the incidence of antibiotic resistance across Europe by educating future prescribers and users on prudent antibiotic use;
- Complement national antibiotic and hygiene educational campaigns;
- Exchange information and experience of good practice in the educational curriculum with European partner countries, and
- Translate and implement the e-Bug resources across Europe in close collaboration with local Ministries of Health and Education.

Project website:
➜ http://www.e-bug.eu

Project in the Scientix portal:
➜ http://goo.gl/bejVOk

## 18. PROFILES

Coordinator: **Freie Universität Berlin, Germany**

Funding scheme: **EC (FP7)**

Presenter: **Claus Bolte, Sabine Streller**

PROFILES promotes Inquiry-Based Science Education by raising teachers' awareness of more effective ways of teaching, with the support of various science education actors.

The project aims to work towards a better understanding of the changing purpose of teaching science in schools and the value of science education stakeholders' networking. PROFILES is based on "teacher partnerships" aiming to implement existing inquiry-based science teaching materials.

Long-term teacher training courses reflecting challenges relevant to the participants raise their skills in developing creative, scientific problem-solving and socio-scientific related learning environments, which enhance students' intrinsic motivation to learn science and their individual competences such as decision-making abilities and abilities in scientific inquiry.

The intended outcome of PROFILES is that science education becomes more meaningful for students and more strongly related to 21st century science and Inquiry-Based Science Education (IBSE), and thus fosters students' scientific literacy.

Project website:
➜ http://www.profiles-project.eu/

Project in the Scientix portal:
➜ http://goo.gl/HV3kb1

## 19. REStARTS

Coordinator: **von Karman Institute for Fluid Dynamics, Belgium**

Funding scheme: **EC (FP7)**

Presenter: **Patricia Corieri, Mario Carbonaro**

RESTARTS develops activities and materials for schools that link science teaching with modern aeronautical research challenges.

The main objective of RESTARTS is to contribute to reversing the current trend of lack of interest among young people towards aeronautics. In this project, the partners from aeronautical research and training institutes develop informative material about current research topics in aeronautics to demonstrate a direct link between research and society. The scientists work in cooperation with a pedagogic team and teachers of local primary and secondary schools to compile understandable teaching materials including simple experiments to demonstrate the physical phenomena being investigated. The school lessons based on this material are designed to give the pupils (aged 6-18) some insight into recent aeronautical research.

Project website:
➜ http://www.fp7-restarts.eu

Project in the Scientix portal:
➜ http://goo.gl/aq08aR

## 20. SUSTAIN

Coordinator: **Fondation La Main A La Pate - France**

Funding scheme: **EC (LLP)**

Presenter: **Janet Ainley, Clémentine Jung**

The SUSTAIN project (Supporting Science Teaching Advancement Through Inquiry) supports effective approaches to Education for Sustainable Development (ESD) through inquiry. SUSTAIN is building pedagogical contents, tools and teachers' professional development activities to foster scientific understanding of sustainable development.

The First European Conference of the SUSTAIN project was organised by the University of Ljubljana, Slovenia. Its main goal was to bring together professionals in ESD and Inquiry-Based Science Education (IBSE) to facilitate cross-fertilisation between those areas.

Project website:
➜ http://www.sustain-europe.eu

Project in the Scientix portal:
➜ http://goo.gl/8zxai5

## 21. Xplore Health

Coordinator: **Parc Cientific de Barcelona, Spain**

Funding scheme: **EC (FP7)**

Presenter: **Rosina Malagrida, Josep Carreras**

Xplore Health is a European gateway to health research offering online and on-site innovative activities through the Internet, schools, science centres and museums.

The project aims to encourage and nurture the active engagement of society with state-of-the-art health research and its wider ethical, legal and social aspects. It facilitates an effective dissemination of attractive, accessible and rigorous resources at European level targeted primarily at students and patients' associations.

The Xplore Health portal provides access to cutting-edge health and medicine research presented in a comprehensible language and attractive format. The specific modules covering various research subjects contain games, videos or virtual experiments that aid a better understanding of all stages of medical research. The interactive environment of the website stimulates direct feedback from users as well as the submission of new contents by qualified scientists or press officers.

Project website:
➜ http://www.xplorehealth.eu

Project in the Scientix portal:
➜ http://goo.gl/czeViy

## 22. inGenious

Coordinator: **European Schoolnet, Belgium**

Funding scheme: **EC (FP7)**

Presenter: **Evita Tasiopoulou**

ECB, the European Coordinating Body for STEM (generally known as inGenious) aimed to reinforce links between science education and technology careers in the private sector by strengthening the industry-education partnership. It developed a repository of practice, disseminated and stimulated good practices in MST and encouraged new innovative practices. The key areas of work were a portal with an observatory of industry-education information, guidance and good practices and a network of over 1,000 primary and secondary schools (with a leading pilot network of 150 schools), which validated the best practices and organised seminars for teachers on industry-education cooperation in STEMT.

Project website:
➜ http://www.ingenious-science.eu

Project in the Scientix portal:
➜ http://goo.gl/kb0kBG

## 23. Scientix

Coordinator: **European Schoolnet, Belgium**

Funding scheme: **EC (FP7)**

Presenter: **Gina Mihai**

Scientix promotes and supports Europe-wide collaboration among STEM (Science, Technology, Engineering and Maths) teachers, education researchers, policy makers and other STEM education professionals.

In its first stage (2009-2012), the project built an online portal to collect and present European STEM education projects and their results, and organised several teacher workshops. The main networking event was the Scientix conference, held in May 2011 in Brussels.

The goal of the second phase (2013-2015) is to expand to the national level. Through the network of the National Contact Points (NCPs), Scientix aims to reach out to national teacher communities, and contribute to the development of national strategies for wider uptake of inquiry-based and other innovative approaches to science and maths education.

Project website:
➜ http://www.scientix.eu

Project in the Scientix portal:
➜ http://www.scientix.eu

## 24. Science: It's a girl thing

Coordinator: **European Commission – Research and Innovation**

Funding scheme: **EC**

Presenter: **Maria Korda**

A pan-European awareness campaign to encourage girls to develop an interest in science and engage young women in scientific research careers. This reflected Commissioner Geoghegan-Quinn's commitment to promote gender equality and the gender dimension in research and innovation.

With the slogan "Science: it's a girl thing!", the first phase of the campaign targeted girls aged 13 to 18, aiming to challenge stereotypes around science and show girls that science can be a great opportunity for their future.

Project website:
➜ http://science-girl-thing.eu/en/splash

Project in the Scientix portal:
➜ http://goo.gl/2wC232

## 25. Responsible Research and Innovation

Coordinator: **European Commission – Research and Innovation**

Funding scheme: **EC**

Presenter: **Maria Korda**


Responsible Research and Innovation (RRI) implies that societal actors (researchers, citizens, policy makers , business, third sector organisations, etc.) work together during the whole research and innovation process to better align both the process and its outcomes with the values, needs and expectations of society.

In practice, RRI is implemented as a package that includes multi-actor and public engagement in research and innovation, enabling easier access to scientific results, the take-up of gender and ethics in the research and innovation content and process, and formal and informal science education.

Project website:
→ http://ec.europa.eu/research/swafs

# PARALLEL SESSIONS I

## 1. Curriculum innovations

**Jukka Tulivuori (Finnish National Board of Education, Finland)**

### 1.1) Education for sustainable development through inquiry (T01)

**Natalija Aceska**

The process of globalisation, the emergence of new technologies and the new ways in which we communicate have highlighted the need for the development of natural sciences in the educational processes of all modern countries, including the Republic of Macedonia. The educational system in Macedonia has undergone several changes, to keep up with the new requirements. One of these important changes is represented by the study of natural sciences being adapted to the educational curriculum from the Cambridge International Examination Centre.

### 1.2) Living biological systems at school (T33)

**Claudia Maria Mazzanti**

A good curriculum in science has to take into account what affects student learning, prompting an urgent need to select which topic to explore and investigate throughout the year, while ensuring the most meaningful learning experiences. A curriculum in science was therefore designed that relies on a new educational methodology which successfully enables students to acquire the concept of natural phenomena with practical activities and inquiry. The aim of this methodology is to highlight students' attitudes in order to best use their knowledge and skills.

### 1.3) INSTEM – Innovation Network in STEM (T23)

**Michela Insenga**

INSTEM (Innovation Network in Science Education) links research, practice and policy in a unique way. The main goals of the project are to promote inquiry-based teaching, to gather innovative teaching methods, and to increase students' interest in science, as well as offering them careers information in STEM subjects, in order to respond to global challenges in teaching and gender imbalances in STEM education

### 1.4) Billion Oyster Project: Curricular innovations in STEM (T67)

**Lauren Birney**

Research consistently shows that children who have opportunities to actively investigate natural settings and engage in problem-based learning greatly benefit from the experiences. They gain skills, interests, knowledge, aspirations and motivation to learn more. But how can we provide these rich opportunities in densely populated urban areas where resources and access to natural areas are limited? This project will develop and test a model of curriculum and community enterprise to address that issue within the nation's largest urban school system. Middle-school students will study New York harbour and the extensive watershed that empties into it, and they will conduct field research in support of restoring native oyster habitats.

## 2. School projects

**Ausra Gutauskaite (Education Development Centre, Lithuania)**

### 2.1) Creativity in teaching science (T11)

**Sanja Bulat and Ivana Jokić**

Acquiring new knowledge of physics and chemistry, recognising it in the world around and connecting it to other subjects, has always been a challenge for teachers. However, the effects of a successfully completed project have proved that this is achievable, especially if the specific objective is to enable students to understand that different approaches to the same subject strengthen their ability to acquire and adopt new subject matters, and that they can find their own learning style through a variety of teaching methods, developing their creativity and production.

### 2.2) Teaching science in Spain (in English!) (T46)

**Alicia Sanz Duran**

Being a teacher for the first time and teaching science and ICT, might already sound difficult enough, but add to these factors the lack of necessary resources (whiteboards for example), and having to teach in English, and the situation becomes far more difficult. Adaptation and improvisation are the key to a successful solution and proof that such challenges can be overcome and mastered.

### 2.3) The alga who wanted to be a flower (T53)

**Ana Cristina Tavares**

“The alga who wanted to be a flower” is a science education activity on the evolution and the identification of main plant group diversity, followed by applying the new knowledge. It uses a formal or non-formal format and the lesson can be presented inside the classroom (exploring the story of the book, with plants or models) or outside the classroom (in a journey through a garden or park).

### 2.4) Karelino – A robot for STEM education (T02)

**Mihai Agape**

Karelino – “Karel: Autonomous Robot for Enhancing Learning” – presents an interesting, developing robotic platform, from which hardware and software lessons can be designed. The robot is often used in science and technology classes to showcase the practical aspect of STEM education, from mechanical to electrical design, as well as the issues faced by the construction team along the way and the solutions utilised.

## 3. Research and schools

**Maija Pollari (LUMA Centre Finland, Finland)**

### 3.1) ICRC Academy (T24)

**Zuzana Povolna**

Though science and research are not often pursued by students, there is a high demand for talented individuals willing to study natural science subjects and to be involved in research activities, underlying the need to motivate young people for a scientific career much earlier than during, or even after the end of their university studies. The ICRC Academy offers a solution to this situation: a unique platform offering a tool for motivation of high-school and university students for careers and further education in the field of science and research, particularly clinical research.

### 3.2) Posters as educational material for science (Special Education) (T38)

**Nikolaos Nerantzis**

Posters represent a visual tool that can be easily accessed on the Internet and can be extended (adding "patches"). The structure of the posters combines images, text, mathematics and sketches. A poster can be part of many lesson plans, for example, as an advance organiser, as a common reference content, summary material, a cross-thematic material, etc. In educational practices, except of the National Curriculum and guides for teaching students with Special Educational Needs, it integrates hands-on low-cost material activities, ICT, inquiry-based teaching (IBSE) and International Bureau of Education (IBE) principles.

### 3.3) Learning science In the 21st century (T43)

**Tania Pinto**

The low interest of students towards STEM education has been the subject of many recent studies, with one solution being that science subjects should be always connected to the students' interests. The teaching/learning methodology "Problem-Based Learning" (framed in Inquiry-based Learning), developed in a socio-constructivist perspective, assumes that pupils are involved in groups in the resolution of an authentic task/problem and the teacher acts as a facilitator of this learning process, assessing pupils' ability to question, to understand and to use available information.

### 3.4) GenPORT: an Internet portal for sharing knowledge and inspiring collaborative action on gender and science (T70)

**Jörg Müller**

GenPORT – an FP7 Coordination and Support action running from 2013 to 2017 – is a developing online community of practitioners, served by an Internet portal and made up of organisations and individuals working across the globe for gender equality and excellence in science, technology or innovation. GenPORT offers an arena for organisations and individuals to showcase and access the world's best research resources, practical materials, policy briefings, experiences, and much more. A wealth of gender and science resources has been produced over the years. However, despite the enormous potential for knowledge sharing, these resources are scattered in various locations, with varying degrees of visibility and usability. GenPORT will provide a single open entry-point to high-quality research, policy and practical materials on gender, science, technology and innovation (STI) in order to enhance the potential for their more effective exploitation.

## 4. Tools and schools

**Christian A. Gertsch (educa.ch, Switzerland)**

### 4.1) Walking in Galileo's footsteps with digital shoes (T48)

**Matteo Siccardi**

An open source GeoGebra applet that makes up for the lack of a fully-fledged physics lab and can be used as an accompanying activity in an (open) online course. The version presented allows for an empirical test of three of the most relevant theorems of Galileo's Discourses. With three different experimental setups, students can see a ball roll down a slope, take measures and perform data analysis, following Galileo's footsteps.

### 4.2) The use of the GLOBE programme in education (T55)

**Piroska Tóth**

The Global Learning and Observations to Benefit the Environment Programme is an international environmental education programme which Hungary joined in 1999. High schools and elementary schools participate in the work. Weather, soil, biological and water quality measurements and observations are carried out and the data are shared online with the participants in 14,000 schools in more than 110 countries. These data can be used freely by anyone.

### 4.3) PLE -supporting personal STEM learning (T69)

**Elisabeth Hall'en**

Personal Learning Environment (PLE) has proven to be a significant factor in making school an interesting, engaging and a challenging place. Teachers' work has become easier and learning processes have become more transparent. Co-design processes have enabled a rapid change in school culture because all stakeholders have been brought into these participatory design processes. In this presentation we will show a short scenario on how PLE has helped one student in primary school and secondary school as well as 10 key elements and recommendations resulting from the project work of the IMAILE consortium.

### 4.4) Chasing Aurora: Using authentic context for STEM (T21)

**Richard Hechter**

A project centred on developing authentic astronomy-themed curriculum and resources, emanating from the wonder and awe of the Aurora Borealis. Punctuated with stunning images of the Northern Lights aligned with excerpts from the new curricular materials developed throughout the project, this session will capture the efforts towards making the science curriculum both geographically and culturally relevant for teachers to teach and students to learn, and the overall learning experience.

## 5. The world around us

**Reet Rannik (Estonian Research Council, Estonia)**

### 5.1) Geosciences serious game: a path in a volcanic area (T08)

**Annalisa Boniello**

The aim of this project was to improve the motivation of students for earth science and to develop their scientific competencies. The strategy used for this aim is a serious game built in a virtual world. This represents an innovative strategy, an educational opportunity to learn in a socially interactive learning community and in an immersive environment. To experience this approach, this research aims at introducing digital contents into geosciences and, in particular, to address the theme of a volcanic area.

### 5.2) Teachers learning about climate change education (T41)

**John Oversby**

Climate change education is cross-disciplinary, a subject challenge for many teachers; its claims are based on modelling from uncertain and partial data that challenge traditional views of what a science is; encompassing subject content knowledge, attitudes to the environment, and commitment to action, a complex set of interactions in comparison with most themes. The research question was: what are the features of climate change education that promote engaging teaching and learning? It used a mixed-methods approach drawing on a variety of written evidence and observations of teacher education sessions.

### 5.3) A new approach for teaching data and statistics (T27)

**Ülle Kikas**

The presentation will introduce a project in computer-based statistics going on in Estonia. The project aims at fundamental change in learning data and statistics in lower and secondary school. It will empower students with the knowledge and modern skills for using mathematics and computers in real life. This new educational approach is based on the innovative vision of computer-based maths, introduced by Conrad Wolfram. It includes development of the new curriculum and digital educational materials, piloting them in schools, monitoring the piloting phase; and academic assessment of the process.

### 5.4) European Space Education Resource Office (T36)

**Pieter Mestdagh**

ESERO Belgium engages primary and secondary school teachers with projects, training and classroom resources, using videos, images, example copies, spacecraft models and many other tools. Most of the projects are organised with partner organisations also active in space education or astronomy, or in STEM education in general. Printed copies and digital copies of ESERO's work will be offered to participants.

## Workshops A

**Dan Stefanica (European Schoolnet, Brussels)**

### A.I) Use of Augmented Reality (AR) in education (WS01)

**Daniel Aguirre Molina and Ascensión Robles Melgarejo**

Augmented Reality is a technology that allows new and innovative ways to represent information. It gives us the possibility not only of transforming a 2D world into a 3D representation, but also enriching plain pictures with more information like videos, 3D models or another picture. Some time ago, this technology may have seemed to be too remote or beyond the knowledge of most teachers, but now Augmented Reality has become easier and it's possible to create some applications in only a few minutes. And also, and more interestingly, these applications can be created by our students, giving them the central role in their learning process.

In this workshop we propose an introduction to AR, starting by talking a little about the state of the art, showing some of the educational experiences we can find in some schools. But the most important part will be a hands-on workshop: There are three dishes in our menu. The starter will be the creation of a campaign with LAYAR, where, in a few minutes, we will have our first development with AR. The main dish will have more content, but easily digestible, working with AURASMA to create some useful applications to enrich our lessons and give us the possibility of using it with our students. And for dessert, the sweetest part, the use of 3D models. This part will require some SketchUp mixed with AR-Media, with a topping of the software "Avogadro" to make a model of some molecules in 3D, as a useful example to learn sciences. With the coffee, if you wish and time allows, more examples of good practices will be discussed.

After the workshop teachers will be ready to use this technology with their students and "augment" their classes, using ICT in an innovative and creative approach.

### A.II) Promoting language skills in primary school (WS02)

**Petra Breuer-Kuppers and Mario Spies**

Inquiry-based learning with biographies makes promotion of language skills in primary school possible in a special way: Students experience the connection of science and language. Reading, understanding and exchange of what they have learned are the main elements to promote language skills. Especially natural sciences give children reasons to talk about the things they did or have found out.

This hands-on workshop is based on the publication "Laternenmond und heiße Ohren" (Lantern Moon and Hot Ears) by Science on Stage Deutschland. Science teachers from Austria, Germany and Italy worked out nine biographical texts for primary-school students about contemporary scientists and engineers. They tell how they came to their profession, sometimes connected with funny moments in their life, e.g. a scientist studying ants or a chemical engineer. Each chapter is connected with experiments and working proposals, such as a rotating LED-disc or a walnut candle. Primary school teachers who work with it do not require any specific scientific expertise.

In this workshop, after a theoretical introduction, we will conduct a practical session for teachers with one example taken from the publication. The publication is available for free at Science on Stage Deutschland (print and PDF, in German): www.science-on-stage.de/laternenmond

## Workshops B

**Premysl Velek (European Schoolnet, Belgium)**

### B.I) Exploring online labs with visually impaired students (WS03)

**Lina Canas and Rosa Doran**

Online lab Faulkes Telescope offers a database of astronomical pictures as well as the opportunity for the students to remotely operate the telescope and to take their own pictures of the cosmos. Since Astronomy is a very visual science most often visually impaired students are excluded from these activities, so the question is: how can we engage visually impaired students in such activities while promoting collaborative work with their peers?

Using image editing software the images collected by the students in the remotely operated telescope may be printed on a swelling paper (a special type of paper that allows its inked areas to swell when heated) and then printed on a thermal printer. This allows visually impaired students to be able to perceive the objects being observed in real time alongside their classroom companions.

With this workshop we plan to present a step by step guide to the participant teachers on how to conduct an in-class implementation of such activity in a joint and enriching experience, allowing visually impaired students to access these online personalised scientific experiments alongside their classmates.

### B.II) Zondle – ICT game-based learning (WS05)

**Bosiljko Derek**

Zondle is a GBL (Game-Based Learning) platform focused on delivering a game-based learning environment. The platform can be accessed on PCs, laptops, iPad and Android devices; it has also been designed for use on interactive whiteboards or with computer projectors and screens.

The basic objective of the workshop will be to familiarise participants in the workshop with the Zondle platform. The aim is to allow teachers to create content for the game to suit the goals of teaching and the needs of their students – to determine what has been learned in school, as a formative or summative assessment or as preparation for complex verification and testing.

At the end of this workshop, participants should be able to:

1. Register, add students and teachers, manage classes
2. Manage content, assigning topics and tasks to students, use ready-made themes made by other teachers
3. Monitor student progress, class statistics, team play.

# PARALLEL SESSIONS II

## 6. Projects I

**Tommy Byskov Lund (Danish National Centre for Science Education (NTS-centeret), Denmark)**

### 6.1) Motivating teacher and student science learning (T28)

**Eleni Kyza**

As Europe works towards becoming a competent knowledge society, young people's diminishing motivation to learn science is troubling. Two projects that try to solve this issue are highlighted: CoReflect and PROFILES. The projects share the emphasis of seeking to reform science practices by designing learning materials which are authentic, can motivate students and can help them engage in evidence-based problem-solving of complex, socio-scientific issues, such as genetic modification and climate change.

### 6.2) Towards a ubiquitous good NST education (T51)

**Moshe Talesnik**

The NanoEIS project (Nanotechnology Education for Industry and Society) investigates European training and preparation of current and future work in nanotechnology. The talk will be based on two research papers: The first paper aims to analyse how nanoscience and nanotechnology (NST) can be used in science and technology education in secondary school systems across Europe, specifically in relation to the learning of science and technology; the second paper deals with the current integration of nanotechnology into secondary schools.

### 6.3) Quantum Spin-Off (T52)

**Laura Tamassia**

The Quantum Spin-Off project brings secondary-school science teachers and their pupils into direct contact with research and entrepreneurship in the high-tech nano sector, with the goal of educating a new generation of scientifically literate European citizens and inspiring young people to choose careers in science and technology. Teams of pupils, guided by teachers, are challenged to create a responsible and socially relevant application of a scientific paper in collaboration with actual researchers and entrepreneurs.

### 6.4) Responsible Research and Innovation, a new paradigm in Horizon 2020 (T63)

**Rosina Malagrida**

The presentation will outline the concept of Responsible Research and Innovation (RRI) and will analyse how the different stakeholders can reflect, deliberate and act together to steer science and innovation towards a more socially desirable and sustainable goal. Special attention will be given to reflecting on how science education can contribute to promoting RRI and an example, the RRI TOOLS project, will be outlined.

## 7. Projects II

**Bertalan Péter Farkas (EDUCATIO Public Services Nonprofit LLC, Hungary)**

### 7.1) Opening science to school students – 10 years on (T05)

**Anna Barton**

The Open Science project aims to motivate students to pursue further education and careers in the natural and technical sciences, which it does through offering opportunities to students, teachers and professional scientists. The project's core activity is focused on the organisation of individual student-scientist internships; thanks to this scheme, over 500 secondary school students (and since 2012 also university students), have been paired on a one-to-one basis with a scientific researcher at one of the Academy of Sciences' institutes or a partner university.

### 7.2) Bringing space exploration to a classroom near you (T64)

**Val Caldwell and Alex Blackwood**

If you have ever struggled to find space-related education resources to use when teaching science in the classroom or if you have never tried, then this is the session for you! We will tell you about an exciting project delivered by the IPN which took eight teachers from around Europe to Houston, Texas, to aid the development of an online resource and a community of practice for science teachers around the world. The IPN works closely with NASA and the international space community to offer teachers and students a unique experience in Houston where they are exposed to education resources alongside amazing role models who work in the space industry.

### 7.3) Implementing strategies in science teaching (T49)

**Menelaos Sotiriou**

A presentation on the proposed methodology to support creative strategies in science teaching through the pedagogical framework that has been developed by the CREAT-IT project and which integrates the arts with science teaching. This framework supports the implementation of a series of training workshops for teachers and subsequent work with their students in schools. The implementation stages will be evaluated so as to conclude with specific recommendations about practices which can be followed in the future.

### 7.4) PARRISE: integrating society in science education (T66)

**Ralph Levinson**

The PARRISE (Promoting Attainment of Responsible Research and Innovation in Science Education) project aims to foster Socio-Scientific Inquiry-Based Learning (SSIBL) in schools throughout the primary and secondary sector. Its specific objective is to develop an appropriate framework for inquiry into matters relating to science and society as opposed to substantive science. This presents new epistemological and pedagogical challenges.

## 8. From early ages to long distances

**Ilze France (University of Latvia, Latvia)**

### 8.1) Enabling creativity and inquiry in early years (T50)

**Fani Stylianidou**

A research project which contributes to a better understanding of the potential available on the common ground that science and mathematics education in preschool and early primary school can share with creativity. More particularly, the project seeks to document and compare current policies and practices in science and mathematics education in preschool and the first years of primary school (up to age eight) in the nine European partner countries (Belgium, Finland, France, Germany, Greece, Malta, Portugal, Romania and the UK), using a variety of methods from desk research to a survey and classroom-focused fieldwork.

### 8.2) Teaching statistics in primary school (T14)

**Silvia da Valle**

The scientific society, institutions and the media recognise the key role of statistics in the current cultural context. The purpose of this presentation is to illustrate methods and results of the specific action plan designed by NPSL (Territorial network of experts in promoting statistical literacy) to support teachers at all school levels. A particular focus is on description of the related educational tools, available for free download from Istat's institutional website, specifically designed and field-tested, to support the teaching of statistical curricular topics to the youngest pupils in primary school.

### 8.3) How research teaching of cycles and symmetries of Sun movements and the Sun/Earth model affects knowledge and attitudes of pre-service primary teachers (T35)

**Asuncion Menargues Marcilla**

A project that tries to solve the problem of pre-service primary teachers who do not have a minimum scientific education and who have negative attitudes to science learning and teaching. It does this by testing the effects of in-depth teaching on diurnal astronomy (cycles and symmetries in Sun movement and their explanation, the Sun/Earth model) as oriented research in knowledge and attitudes of pre-service primary teachers.

### 8.4) The Future Project: A new cooperation (T26)

**Roger Kennett**

The Future Project is based on the "Inspiring Australia" report (2011), which identified a need for activities which increase the involvement of young people in science and engineering in Australia, as well as developing their literacy about important issues in these areas. The main focus of the Future Project is to motivate and engage the next generation of scientists and engineers by providing students with the opportunity to collaborate with scientists and engineers, to solve real-world problems and to communicate this innovation to the broader public.

## 9. Energy, engineering and nanotechnology

**Zuzana Mészárosová (Obchodná akadémia, Slovakia)**

### 9.1) STE&M intertwined – Learning by analogy (T06)

**Yair Ben-Horin**

The integrated study of STEM subjects, as in the science and engineering track, offers a significant pedagogical advantage. Rather than studying each subject separately, students enjoy diverse, multi-disciplinary classes that enable a broader and more adequate perspective. This means integrating different fields as opposed to just studying them in parallel. Thus, to the straightforward acquisition of knowledge, the ability to create connections between different ideas and different fields is added – all of which raises the value of the knowledge the students accumulate.

### 9.2) The Green Agents Mission (T13)

**Anna Christodoulou**

The Green Agents Mission is an educational programme for sustainability, focusing on energy consumption. The aim of the project was to develop an energy curriculum that would help students aged 9-12 understand the science behind current environmental issues, so as to help reduce electricity use in their schools and to spread the word in their community. The curriculum developed links everyday life (electricity usage and carbon footprint) with global environmental issues, like the enhanced greenhouse effect and climate change.

### 9.3) From NanoYou to secondary school Nano studies (T47)

**Nira Shimoni-Ayal**

Following surveys taken during the early 2000s which showed that most European citizens have a poor understanding of nanotechnology (NT) and its potential risks, it was decided that this needs to be rectified if the European public is to contribute positively to future decision-making about the use of NT. NanoYou (Nano for Youth) aimed to increase young people's basic understanding of nanotechnologies (NT) and to engage them in the dialogue about NT's ethical, legal and social aspects (ELSA). By the end of the project more than 160,000 visits were counted for the Web portal, from more than 100 countries.

### 9.4) Aquaponics in classrooms as a tool to promote system thinking (T62)

**Ranka Junge**

Aquaponics plays a part in promoting sustainable development on different levels in society, as well as representing a very valuable tool in education. "System thinking with Aquaponics" is an educational concept developed in the FP6 Science and Society project WasteWaterResearch (www.play-with-water.ch), which aims to train students in system thinking by using a connected fish and plant culture system. System thinking is seen as a central skill in education for sustainability.

## 10. National projects

**Jacinta Burke (PDST, Ireland)**

### 10.1) Didactic method helping to obtain comprehension (T22)

**Uldis Heidingers**

The Goerudio Project aims to choose the best methods in teaching hard sciences. Consequently, a system was created in Latvia that directly involves students in creating and storing models to gain comprehension of these sciences. This represents a didactic method where by using notions and association skills, students produce their own conclusions on things and natural phenomena. The method gives good results because it stimulates thinking in a non-traditional way.

### 10.2) IBL for raising students' attraction to science (T59)

**Francesca Ugolini**

The Acariss (Increasing knowledge on environmental issues and pollution risks involving schools in experimental activities) science project developed twelve didactic modules on various environmental issues (carbon dioxide and the greenhouse effect, global warming, eutrophication, plants and salinity, robotics, etc.) following the 5E Instructional Model of Inquiry-Based Learning. In two years, Acariss was used in about 80 classes, involving about 70 teachers and 2000 pupils.

### 10.3) Promoting excellence in STEM education (T60)

**Andrea van Bruggen**

The presentation will outline the U-Talent Academy and show some examples of U-Talent Academy enrichment topics, in particular from chemistry lessons. Moreover, the results of some studies on the effects of the programme on students will also be presented, with a focus on: their motivation for STEM, their results in the national examinations and their participation in University STEM studies after leaving the Junior College of Utrecht (JCU). There will also be a discussion on what secondary schools and universities can learn from the JCU approach.

### 10.4) The Cell EXPLORERS programme (T20)

**Muriel Grenon**

Cell EXPLORERS is a science outreach and public engagement programme based in the School of Natural Sciences (SNS) at NUI Galway, which aims to inform, inspire and involve the general public in science, technology and research by connecting primary, second level, third and fourth level students, lecturers, researchers and the general public. The programme is based on the establishment of a unique model of sustainable public engagement for higher education institutions.

## Workshops C

**Dan Stefanica (European Schoolnet, Belgium)**

### C.I) Sparkling IBSE: Hummingbird seeks Bromeliad (WS07)

**Sonja Eilers and Yvonne Matzick**

In this workshop we invite the participants to investigate some remarkable IBSE activities. We will present some of the most sparkling activities developed and conducted within the "INQUIRE for Student Course" in Bremen. We invite the participants to test some of them hands-on and/or minds-on and to discuss their further development.

We start with the IBSE activity "Climate and Ice" and invite participants to build hypotheses about the Ice-Albedo-Interdependence and how polar ice may influence the ocean streams. The experiment "Gulf Stream in the aquarium" allows the hypotheses to be tested.

A further IBSE activity we called "Expedition to Mount Kinabalu". This is a prominent mountain, 4,095 metres above sea level and the highest peak in Borneo. The mountain is among the most important biodiversity hotspots in the world, with between 5,000 and 6,000 species of plants. We invite the workshop participants to walk with us through the Malaysian rainforests and explore the different adaptation of plants in their struggle for light and mineral nutrition. Examples of this are different epiphytes like Orchis sp., ferns, and the symbioses of Nepenthes sp. with mammals. Which traces of climate change can we recognise during our hike to the peak? How do palm oil plants influence the climate?

Then we move to Central America and Costa Rica. The IBSE activity "Hummingbird seeks Bromeliad" is a sparkling activity in the context of pollination. Why are some of the Bromeliad species green and others grey? Why do they have such colourful blossoms? What makes Bromeliad species so successful in their adaptation to a changing climate?

The IBSE activity "It's my choice" is a mystery focusing on the Wild Tobacco plant, a generalist and winner from climate change, and the fascinating strategy of choosing between butterflies (Sphingidae) and birds (Hummingbirds) as pollinators to prevent predators.

### C.II) BioDansciences Project – Part 1 and Part 2 Workshop (WS12)

**Ana Guadalupe Valenzuela Zapata and Gea Zazil Hernandez**

Dance has always been a part of human culture; most dancing is about recreation and now we want to perform for biological sciences teaching. Dancing is an enjoyable way to be more physically active and stay fit and we propose it here also for teaching biology.

In our workshop we – a scientist in biology (also an amateur dancer) with a professional dancer and choreographer and some volunteer students – want to guide and encourage you to perform a "Proteins Dance". As biology teachers we are forgetting an exciting way to teach young people the dance benefits for health. We are going to test how Life Phenomena as protein movements could be performed and discovered with a choreography. If you are interested in this experience please be aware of these points:

a) All humans beings can participate
b) You do not need to be a professional dancer
c) You are not in a dance competition
d) Release your flexibility for improvisation and creative expression
e) You need comfortable clothes and shoes.

This educational "dance seminar" creates emphases in a science–art–entertainment interaction and biological information exchange with a small number of participants. In our workshop week programme we have a special course developed in improvisation dance techniques. Come for a Bio Dansciences teaching experience!

## Workshops D

**Ioanna Leontaraki (European Schoolnet, Belgium)**

### D.I) Outdoor challenges (WS06)

**Anna Ekblad**

The aim of the workshop is to give inspiration and ideas about how to use the surrounding neighbourhood when teaching young students science and technology and at the same time connect to the curriculum. We would like to give the participants in the workshop tasks that will trigger them to use the knowledge and experience they already have, in new ways, combining it with that of others by interacting within small groups. We start by making creating smaller groups from the big group, 4-6 persons in each group.

The task this time is to get a marble up from the ground to a height of about 30 cm, on top of a pile of dirt or sand (nearly anything goes) and from there let it roll down, taking 7 seconds. That is not as easy as it sounds!

That means that every group has to start finding out how to bring the marble up. To help, we offer different kind of materials like apples, cardboard, string, sticks, tape, knives and so on. They can also use materials they may find in the surroundings. We also offer water because we hope they will find out it could be done building an elevating wheel or water wheel.

When the marble is up it's time to let it roll down, but *not* just by letting it go. It has to take some time to do it: 7 seconds. To make this work it is necessary to find out a way to slow down the speed of the marble or let it roll a longer distance. To do this the participants can use all the materials above.

When all groups have solved the tasks it is time to check the different solutions and discuss how they solved them. It is also important to discuss how this can be connected to the curriculum.

After the workshop the participants can see how to use the surrounding environment, how the students exchange knowledge and experience and use it as a complement to ordinary indoor education and hopefully want to do more work outdoors.

We now want to do this workshop work as education advisers at Naturskolan (Nature school) in Lund, Sweden. We work with outdoor education and one of our most important roles is to educate teachers. We have just finished a book on teaching science and technology for very young children outdoors (up to 7) but we also work with teachers from primary, secondary and high school. Our philosophy is that if we can show teachers the benefits and joy of teaching science in reality, the students will see how it works in real life; this makes it easier to get the students more interested. They get the subject in the form of a concept which enables them to understand the meaning of it. Another very important thing with teaching outdoors is that it is easy to do, you don't need a lot of material (you get it where you are), and it's fun!

### D.II) The mass of an astronaut in zero gravity (WS09)

**Dominique Lambert**

Measuring the mass of an astronaut in zero gravity is vital for the control of muscle and bone mass as well as maintaining a constant mass for spacewalks (the suit has stringent dimensions). How to measure the mass in weightlessness without a weighing machine?

The activity is to get the mass of an object hanging from a spring. Measurement of the period of the oscillating movement of the suspended mass and knowledge of the spring constant are used to obtain the weight. To measure the period two techniques are used: measurement with the iPad clock, and possibly the use of a force sensor connected to the iPad. The analysis of a graphic on the iPad showing force versus time provides the period. Depending on the time available, the time is also measured at the start of a film of the periodic motion and its analysis with Tracker (free software) and a spreadsheet (OpenOffice).

Frank de Winne conducted the same experiment on the ISS. A video of this experiment will be proposed to complete the activity or presentation. This lab is achievable by the teacher or as a demonstration by students in one class period

# PARALLEL SESSIONS III

## 11. Role models and good examples

**Douglas Armendone (educa.ch, Switzerland)**

### 11.1) Meet the Scientist (T18)

**László Antos**

Identifying that young peoples' attention can effectively be directed to the STEM fields only by direct access to secondary school level (essential for the strengthening of the human resources of innovation), the Meet the Scientist programme was launched in 2010. The goal is to promote engineering and natural sciences along with education in the United States among high school students. At every meeting, a former Fulbright scholar as a volunteer gives a 30-minute presentation about his current research, scientific activity and past Fulbright experiences.

### 11.2) It's my choice – women in STEM studies (T19)

**Doris Elster**

IRIS (Interests and Recruitment in Science) is a European project that focuses on the challenge that few young people in general, and women in particular, choose an education and career in science and technology. IRIS contributes to the improvement of recruitment, retention and gender equity patterns in higher education. To this end, a questionnaire was developed that would allow the identification of fostering and hindering factors for choice and stay in STEM studies. It highlighted that gender influences the choice and identified some country-specific differences.

### 11.3) How to use Participatory Action Research to foster inquiry-based learning in science education (T32)

**Anna Majer**

A presentation on the benefits of Participatory Action Research (PAR) in a collaborative project involving the science education research and development team of the Hungarian Institute for Educational Research and Development (OFI) and eight primary and lower secondary schools in Hungary. The overall project develops educational programmes for all-day schools, incorporating modular units designed for regular science lessons and extracurricular activities with a special focus on Inquiry-Based Learning (IBL).

### 11.4) Fostering innovation in STEM education (T15)

**Maite Debry**

In this session, the Reach Out Toolkit, the main tool produced by the DESIRE (Disseminating Educational Science, Innovation and Research in Europe) project, will be presented. This publication highlights the method used to analyse dissemination of STEM education projects results and gathers recommendations to better reach teachers and other science education stakeholders. The project started from the observation that the multiple funded projects in science education (funded around Europe each year), have a great potential to change existing teaching and learning practices but their impact is sometimes low and the outcomes are often not used as expected.

## 12. IBSME

**Constantinos P. Constantinou (University of Cyprus, Cyprus)**

### 12.1) Science demonstrations as a tool for Inquiry-Based Learning (T03)

**Paul Nugent and David Keenahan**

Science demonstrations offer a powerful tool for engaging students in active science learning. The workshop outlined in this presentation has been designed within the context of Inquiry-Based Science Education. Many of the demonstrations have counterintuitive outcomes and most of the suggested explanations are plausible. The students are asked to observe the components of the demonstration; they then consider issues raised by the demonstration, which are presented as multiple choice questions (MCQ).

### 12.2) Inquiry-based learning in physics and maths classes (T10)

**Patrick Bronner**

A problem every teacher has to cope with is the presence of students with different levels of performance in one class. How can teachers take this heterogeneity into account and support individual learning processes? One possibility, in maths and science classes, is the implementation of inquiry-based learning (IBL). During the talk several IBL tasks from secondary school, linked to physics and mathematics, will be presented, with all tasks being available online.

### 12.3) Sustainable inquiry-based science learning (T30)

**François Lombard**

Inquiry-based learning is recommended (often required) as a science teaching format. In this presentation, the results from successive inquiry designs, implemented during most of the school year in high school biology majors, will be showcased. In total, more than 200 students were involved in the study, with the data being based on the wiki recordings of all versions of the student texts produced during the research. The main data source is represented by the design changes that occurred and the educational outcomes created over a period of several years.

### 12.4) Uptake of Fibonacci in Spain (T58)

**Antonia Trompeta**

The University of Alicante's IBSE group has been working in the expansion of inquiry-based methodology from the 1980s. It was engaged in the Fibonacci Project from 2010 to 2013 and continues to train pre-teachers and in-service teachers in that inquiry-based methodology. The presentation will highlight the IBSE materials used in the development of the project as well as the research results on the evolution of confidence and feelings of the participating students.

## 13. Projects III

**Miriam Bugeja (Ministry of Education and Employment, DQSE, Malta)**

### 13.1) COMBLAB (T54)

**Montserrat Tortosa**

COMBLAB (COmpetency-MBL-LABoratory) is a European project that aims to: (1) provide new research-based teaching materials to promote scientific competencies in secondary school students using Microcomputer-Based Laboratories (MBL), and (2) provide research-based teacher training modules to scaffold secondary teachers to enhance science competencies in their students using MBL. Preliminary versions of the activities were translated into Catalan, Czech, German, Finnish and Slovak, and were implemented with 865 secondary school students from five countries in 2012-2013.

### 13.2) ASTEP and professional development (T56)

**Evelyne Touchard**

Supporting Science and Technology in Primary Schools, initiated by the foundation “La main à la pâte,” involves a school teacher and one or more science student(s) working together to provide inquiry-based science teaching. This approach, strongly encouraged by the Ministry of Education, is complex, as the teacher has to do science and teach science to students. This study falls within the field of professional learning and its analysis was based on explanatory interviews conducted with the teachers in order to understand the “brakes and levers” they face when designing and implementing inquiry-based science teaching.

### 13.3) DynaLearn (T61)

**Bert Bredeweg**

DynaLearn has developed an Intelligent Learning Environment that allows learners to acquire conceptual knowledge by constructing and simulating qualitative models of how systems behave. Research points out the importance of learners’ constructing conceptual interpretations of systems’ behaviour. But what kind of tool is needed to accommodate the true nature of conceptual knowledge? Addressing this question, DynaLearn has developed six distinct representations, which act as scaffolds to support learners in developing their conceptual knowledge.

### 13.4) School on the Cloud: lessons from Digital Earth (T17)

**Karl Donert**

The digital-earth.eu project networked more than 80 organisations involved in using Digital Earth technologies in schools, teacher education and training. The presentation will review the outcomes of the ambitious network, recently rated at 90% by evaluators from the European Commission and receiving a Global Award for Capacity Building in education from the GeoSpatial World Forum. It will examine the digital-earth.eu legacy and subsequent developments through the School on the Cloud network: Connecting Education to the Cloud for Digital Citizenship.

## 14. Teacher training, continuous learning and assessment

**Jostein Kvisterøy (Norwegian Centre for ICT in Education, Norway)**

### 14.1) Promotion of science vertically (T07)

**Natalija Bohinc Zaveljcina**

Interest in the natural sciences is becoming more and more popular and desirable among students. Since pupils and children acquire this knowledge even faster and with greater enthusiasm, it was decided to invite younger generations (aged 5 to 10) to participate in some amazing science workshops. The young visitors were thrilled by the workshops (chemistry, physics, biology, mathematics and gym), and so were their accompanying teachers, who expressed their satisfaction in their feedback. The presentation will focus on the results and development of these workshops.

### 14.2) Teacher education by science centre pedagogy (T45)

**Hannu Salmi**

The Department of Teacher Education at the University of Helsinki, in cooperation with Heureka (Finnish Science Centre), has developed a course for both aspiring teachers and teachers wanting to further their professional development. This course has been running for twenty years for all trainee teachers in Helsinki, with the development work being conducted as part of several European projects, such as Hands-on & Brains-on, CONNECT, PENCIL, Science Center To Go, Natural Europe, Fibonacci, PATHWAY, Open Discovery Space, and INSPIRE.

### 14.3) Strategies for Assessment of Inquiry Learning in Science (SAILS) (T72)

**Eilish McLoughlin**

The Strategies for Assessment of Inquiry-based Learning in Science (SAILS) project (2012-2015) has been funded by EU 7th Framework Programme to support teachers in adopting inquiry-based science education (IBSE) at second level (www.sails-project.eu). This will be achieved by utilising existing resources and models for teacher education in IBSE, both pre-service and in-service. In addition to SAILS partners adopting IBSE curricula and implementing teacher education in their countries, the SAILS project will develop appropriate strategies and frameworks for the assessment of IBSE skills and competences and prepare teachers not only to be able to teach through IBSE, but also to be confident and competent in the assessment of their students' learning.

### 14.4) ASSIST-ME: Assess inquiry in science, technology and mathematics education (T73)

**Jens Dolin**

The overall aim of ASSIST-ME is to provide a research base on effective uptake of formative and summative assessment for inquiry-based, competence oriented Science, Technology and Mathematics (STM) education in primary and secondary education in different educational contexts in Europe and to use this research base to give policy makers and other stakeholders guidelines for ensuring that assessment enhances learning in STM education.

## 15. Science and social inclusion

**Florian Kaiser (SiS Catalyst / University of Liverpool, United Kingdom)**

### 15.1) Listening and empowering children (T65)

**Vanessa Mignan**

This short presentation will present opportunities to explore and identify the best ways to involve children (aged 7-14) in the social, cultural, political, educational and scientific decision-making processes that will affect their future. Also the presentation will illustrate how institutions can be supported and guided to work with children. The presentation will include several case studies and best practices, to show how this is implemented.

### 15.2) Targeting activities for under-represented groups (T65)

**Pravini Baboeram-Mahes**

Educational institutes as well as teachers and lecturers are confronted with a growing diversity of students, while at the same time certain groups are still under-represented. This presentation will explore opportunities for under-represented groups to be targeted and a teaching and learning environment to be designed which is able to serve a diversified group of learners. The concepts of locally defined minorities and inclusive excellence will be exemplified as tools for the future.

### 15.3) Ethics of working with children and students (T65)

**Mari-Liisa Parder**

Within the framework of the SiS Catalyst project, guidelines to work with children, and also guidelines to work with students, were developed. These guidelines will be presented, as well as considerations as why it is important to include ethics and what this could look like in practice.

### 15.4) Implications of delivering science and social inclusion activities (T65)

**Tricia Jenkins**

Science is deeply interwoven with society, and both are constantly changing. We are living in a time of technological transformation which questions our local and global priorities for the future. The responsibility for addressing these challenges needs to be shared by all of us, including children and young people, as it is their future we are currently creating.

## Workshops E

**Victor Perez-Rubio (European Schoolnet, Belgium)**

### E.I) Learning maths through new communication factors (WS10)

**Gregoris Makrides and Rosemary Strevinioti**

In this workshop we will discuss the guidelines for the two methods developed by the Le-MATH project, that is the MATHFactor and the MATHeatre methods. The guidelines are developed based on the collection and study of good practices in more than ten European countries.

We will view online videos of actual implementation and discuss and analyse the video samples of performance by pupils aged 9-18. This will give a clear overview and hands-on experience to the participants and will help them understand the two methods and how these could improve the learning of mathematics as well as the change of attitudes towards mathematics. Participants are expected to be teaching mathematics and science to pupils in the age group 9-18. The method can be used by other disciplines, so participants could be from different fields. The Le-MATH project is funded by the European Commission through the programme LLP-Comenius MP (2012-2014).

### E.II) Learn maths through code (WS11)

**Tullia Urschitz**

The aim of the workshop is to involve participants in an active learning environment that can be useful to stimulate first grade and pre-school children to develop maths and problem-solving skills through coding activities that don't require the use of computer. Using simple "coding" instructions, children (here the participants) will be introduced to several skills and STEM concepts like:

- quantity
- counting
- spatial orientation
- problem-solving
- use of specific language, etc.

## Workshops F

**Evita Tasiopoulou (European Schoolnet, Belgium)**

### F.I) Imagine... science for your future (WS13)

**Lotte van den Berg**

A disinfecting soap based on plants, a cheap way of purifying water with locally available means, or strengthening bridges with micro-organisms: every year the Foundation Imagine Life Sciences organises the Imagine School Competition for high school students and leading scientists who want to make a difference. We challenge them not only to translate research from the Life Sciences and Technology field into a sustainable and innovative application, but also to write a business plan describing the implementation of this idea in a developing country.

The Foundation Imagine links scientific research, education and development cooperation. By organising the Imagine School Competition we introduce Life Sciences and Technology to a new generation in an inspiring and fascinating way. We contribute to excellence in secondary education and show students the opportunities of their future. Moreover, we show the public what the challenges are in science in general and how science can contribute to society. Finally, we encourage scientists to use their expertise to help people in developing countries and create more knowledge and welfare.

In the hands-on workshop, the teachers (participants) will experience what the high school students learn and do during the Imagine School Competition. We will take them through the whole process from idea/technology, via entrepreneurship and innovation, to presenting the application.

### F.II) Gender in STEM education (WS14)

**Chiara Tripepi and Jukka Rahkonen**

Teachers greatly influence the decisions that students make in their lives, and play a role in the choices made by their students. In your profession as a teacher, you educate and empower students, by helping them to understand science and other subjects. When it comes to science education, research shows that there are differences in our approaches to boys and girls. How can teachers better engage both girls and boys in science? “Gender thinking” outside the classroom is changing. Do teachers take this into consideration? This workshop will help participants “think gender” and adapt their practices. It will also help them reflect on their teaching and its gender implications.

# PARALLEL SESSIONS IV

## 16. Coding in education

**Marietta Grammenou (European Commission)**

### 16.1) Computer programming and coding skills in national, regional or school curricula (T68)

**Katja Engelhardt**

In this presentation we will share the results of a survey launched this summer by European Schoolnet for which 20 Ministries of Education gave an overview of their current initiatives and plans on computer programming and coding skills in national, regional or school curricula. Computer programming and coding is already part of the curriculum in 12 countries: Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Greece, Ireland, Italy, Lithuania, Poland, Portugal and the UK (England). The talk will include how is coding integrating in the curriculum, what training will teachers receive and how assessment is considered in that field.

### 16.2) Programming Creative Games in Estonia (T71)

**Tauno Palts**

Estonia is a small a country in the Baltic region of Northern Europe, where October is coulourful, but cold and rainy at the same time. October is the perfect time to start with programming creative games. Three student-made weather inspired games are demonstrated during the talk: Scratch game (from 10-12 years old students); App Inventor game (from 13-15 years old students) and Python game (from 16-18 years old students).

## 17. Out of school learning

**Evgenia Sendova (IMI-BAS, Bulgaria)**

### 17.1) Science Camps in Europe (T12)

**Susana Chaves**

The workshop will introduce the Science Camps international project and share its preliminary results. The project considers that Science Camps are one answer to young peoples' lack of interest in STEM, trying to engage them in scientific questions and helping them develop a positive attitude towards these fields. Not only the career decisions but also the development of scientific literacy are the main aims of these camps. All activities in the Science Camps are supported by ICT, making it not only the target, but also the vehicle to acquire scientific literacy.

### 17.2) Science on European School Radio (T57)

**Eftychia Touliou**

Nowadays, we all acknowledge that science in education needs a more social approach. In terms of socio-scientific issues targets, it is very important to involve people in discussions relating to science topics. A new media platform called European School Radio (ESR) has been created, where students from every cultural and national background broadcast on Web radio, share their opinions and conduct debates on specific topics and news.

## 18. Mobiles and games

**Vladimíra Pavlicová (DZS, Czech Republic)**

### 18.1) Mobile learning: Go for it! (T39)

**Stavros Nikou**

In recent years, the use of mobile devices has significantly increased among the youth population. However, despite the widespread adoption of smartphones and tablets in everyday life, their use in education is in an early adoption phase. Moreover, the "anytime, anywhere" feature of mobile learning may have a considerable impact on how learning takes place in many disciplines and educational contexts. This presentation will argue that mobile technology could play an important role in education, with a special focus on inquiry-based learning.

### 18.2) STEM for all: Developmental & game-based approach (T40)

**Tuula Nousiainen**

The need to make scientific careers more attractive has been a major challenge for a long time. However, in many cases, this challenge is recognised too late, when many students have already lost their interest and dropped out of the "scientific path". The presentation will reflect on these issues from the perspective of two projects: the European UPDATE (Understanding and Providing a Developmental Approach to Technology Education) project, and the FUN (Finland-U.S. Network for Engagement and STEM Learning in Games) project.

## 19. Competence learning and motivation

**Bernhard Racz (ENIS Austria)**

### 19.1) A crossed approach for a competence-based learning (T29)

**Michela Tramonti**

Building on the eight key competences for lifelong learning identified by the European Commission in 2006, the KEYS (Key Methodology to Successful Competence-Based Learning) project aims to use and promote the results achieved by five previous Comenius Multilateral Projects which focused on the acquisition of key competences for lifelong learning. In this way, it aims to provide support to teachers and school educators for the implementation of competence-based education capable of responding to the requirements of contemporary life.

### 19.2) Towards the improvement of students' motivation in learning physics (T44)

**Marina Poposka**

In the light of the low popularity of physics in schools, it is considered that teachers should put renewed efforts into finding ways of boosting motivation and interest for learning this subject. The presentation will provide information on how to differentiate teaching methods and strategies in the teaching of physics processes, according to varying motivational factors and differentiated needs.

## 20. Remote and digital

**Silvia Panzavolta (INDIRE, Italy)**

### 20.1) Remote experiments about bioclimatic architecture (T31)

**Anthoula Maidou**

Education for Sustainable Development (ESD) has become a very important issue recently, as it encourages students to understand and assess their own values and those of the society in which they live, in a sustainable context. The presentation will showcase a distance learning education project designed by the e-science group of the Physics Department of the Aristotle University of Thessaloniki, with the aim of introducing secondary school students to zero-energy houses and bioclimatic architecture solutions.

### 20.2) Science learning: the analogue versus the digital (T42)

**Sai Pathmanathan**

The classroom of today is very different from that of thirty years ago; whiteboards, tablet computers, digital gaming devices and YouTube can often be found in most classrooms around the world, whether primary or secondary. Consequently, the presentation will explore the use of analogue and digital in science education (both formal and informal science educational settings) and ask whether the real question should be: how do we strike the right balance between the two?

## Workshops G

**Victor Perez-Rubio (European Schoolnet, Belgium)**

### G.I) Real-time experiments for the acquisition of science competencies: COMBLAB project (WS04)

**Fina Guitart and Montserrat Tortosa**

COMBLAB (COmpetency-MBL-LABoratory) is a European project (517587-LLP-1-2011-1-ES-COMENIUS-CMP) that aims to provide new research-based teaching materials to promote scientific competencies in secondary students using Microcomputer-Based Laboratories (MBL). In Microcomputer-Based-Laboratories (MBL), experimental data are obtained using sensors, and the graph of the experiment can be seen in real time.

The aim of this workshop is to present the general framework of COMBLAB activities by performing two practical activities. MBL equipment and temperature and pH sensors will be used. All the activities designed in the project are inquiry-based, contextualised in personal, social or global environments, and curricular. In the activities, students are guided to solve an initial problem, planning, designing and performing experiments, discussing results and drawing conclusions.

The first activity, “How can we obtain ice cream without a freezer?”, deals with the concepts of the melting temperature of substances and mixtures and cryoscopic decrease. To answer the question, students have to experiment with what happens if they use only ice to cool two samples of water and a sugar solution. After these preliminary experiments they will use an ice-salt mixture as a cooling bath. Graphs of the freezing curves of substances and mixtures are obtained. They have to design and experiment to compare freezing curves using mixtures of orange juice and sugar to optimise the process and obtain the ice cream.

In the second activity, “Which antacid is more efficient?”, students deal with acid, base and neutralisation concepts. They simulate gastric juices using a diluted hydrochloric acid solution, and they can use commercial antacids in various pharmaceutical forms (chewable tablets, effervescent tablets, liquid forms, etc.) and various active ingredients (carbonates, hydrogen carbonates, hydroxides, etc.). Graphs of pH versus time are obtained using different antacid drugs. To answer the question, students have to discuss changes in pH and the velocity of these changes and pH values after the addition of the antacid. They have to experiment and register and discuss curves of pH versus time.

In COMBLAB activities experiments are conducted using small amounts of substances to minimise waste and potential risks and to promote these habits and skills in students.

## Workshops H

**Marina Jimenez-Iglesias (European Schoolnet, Belgium)**

### H.I) Scientix and elevator pitches (WS08)

**Tatjana Gulič, Alojz Blazic, Ivan Đerek, Milorad Vučković and Bosiljko Đerek**

Imagine you meet the president of the European Commission in a lift. You see you will be travelling together for five floors. You have that time to convince him of the success of Scientix. What do you say? How do you say it? During this workshop participants will learn about the experiences of Scientix Ambassadors in disseminating science education projects throughout Europe, with special examples from Slovenia, Croatia, and Bosnia & Herzegovina. Furthermore, participants will learn and practice preparing elevator pitches on their activities and projects.

# ROUND TABLES

## RT1) There Is a world outside to discover through IBL with 4elements

**Marina Jiménez Iglesias (European Schoolnet, Belgium)**

In the European educational context, reports by expert groups have identified the need for a renewed pedagogy in schools to overcome deficits in science and mathematics teaching and to raise the standards of scientific and mathematical literacy. Inquiry-Based Learning is considered the method of choice. IBL involves exploring the world, asking questions, making discoveries, and rigorously testing those discoveries in search of new understanding. Inquiry-based learning can have many faces, dependent on context, target groups and learning aims. However, IBL approaches all have the shared characteristics of aiming to promote curiosity, engagement and in-depth learning.

In this round table, the speakers will set out the main features of the IBL process in the 4elements international project (Comenius 2012-2014) run by seven schools from seven countries. They will discuss how they came up with the project, how they checked this methodology, student-centred versus teacher-centred approaches in the use of ICT resources, for example; and they will share examples of how they introduce this method in their lessons and of didactic resources for direct use in the classroom.

Speakers:

- Carlos Cunha (Escola Secundária Dom Manuel Martins, Portugal)
- Mojca Orel (Gimnazija Moste, Ljubljana, Slovenia)
- Malgorzata Zajaczkowska (Zespol Szkol Integracyjnych no 1, Bialystok, Poland)
- Daniel Aguirre Molina (Colegio Pedro Poveda, Spain)

## RT2) Mindcrawler

**Gina Mihai (European Schoolnet, Belgium)**

Four schools, three countries, two technologies, one project. This project was created during a Scientix Teachers workshop dinner in Riga in 2014. The main idea behind this project is a cooperation between different countries. Using Lego Mindstorms, robots were built equipped with a smartphone which allows a “first-person view” from the robots. The robots in Verona and Budapest were then controlled by students in two schools in Austria remotely.

In this round table, the speakers will explain how the project was conceived and how it went from a dinner discussion to a full project, its implementation, stories and impact on the students.

Speakers:

- Hermann Morgenbesser (KIS Klosterneuburg, Austria)
- Gergely Nádori (Alternatív Közgazdasági Gimnázium, Hungary)
- Tullia Urschitz (IC Bartolomeo Lorenzi – Fumane VR, Italy)

## RT3) Quality standards on educational resources

**Pedro Russo (UNAWE International Project Manager, Netherlands)**

The amount of educational content freely available on the Web is large and growing fast. Educators face by many difficulties when searching for and comparing resources available online. These difficulties range from discoverability and quality to openness of the resources. The Open Education Resources (OER) framework Reuse, Revise (Alter), Remix, Redistribute addresses some of these challenges. However, this framework lacks a review process to assure the quality and accuracy of the content. To address the need to review the resources, astroEDU use a review system similar to that used in academic knowledge creation and dissemination; the peer-review model.

As more projects are approved and content produced, it is crucial to have a quality standard on educational resources. How do different projects address the quality of their resources? Is there one solution for all? Representatives from astroEDU, Open Discovery Space, GenPORT and Scientix will discuss and share their experiences in this round table.

Speakers:

- Erik Arends (Leiden University / Universe Awareness, Netherlands)
- Sofoklis Sotiriou (CTI, Greece)
- Premysl Velek (European Schoolnet, Belgium)
- Jörg Müller (Universitat Oberta de Catalunya, Spain)

## RT4) Informal learning, science centres, museums and cafes

**Moderator: Evita Tasiopoulou (European Schoolnet, Belgium)**

The speakers in this round table have different experiences, all connected with bringing science to the general public outside the formal education channels. From Micro Museums to programmes on art, science and technology for young people, from science centres to open researchers' nights. All four programmes also aim to interest youngsters in science careers. How do they do it? What do they have in common? How can teachers or other organisations learn from them and replicate them in their own countries?

Speakers:

- Gonzalo Abellán (MUDIC-VBS-CV, Spain)
- Patricia Barciela (Museos Científicos Coruñeses, Spain)
- Patricia Verheyden (Technopolis, the Flemish Science Center, Belgium)
- Ana Bedalov (Centar Zlatna Vrata, 04. Croatia)

## RT5) School–industry collaboration

**Maria Karamitrou (European Commission, Belgium)**

Why is it important for industry and schools to work together nowadays? Is it a new thing? Is it easy for companies to get involved in education? Is it easy for schools to open their doors to industry?

The speakers in this round table will address these and more questions and will share their experiences in national initiatives both from the Ministries' and industry point of view (as in the Netherlands and Sweden) and the teachers' point of view (as in Germany and Finland) of getting industry and schools to work together.

Speakers:

- Emilie de Vries Schultink (Platform Bèta Techniek, Netherlands)
- Tobias Eriksson (Teknikföretagen, Sweden)
- Jörg Haas (Jakob-Fugger-Gymnasium Augsburg, Germany)
- Tiina Kähärä (Kytöpuiston koulu, Finland)

## RT6) Science fairs and competitions

**Karen Slavin (European Commission, Belgium)**

In science fairs, young researchers present and defend their science project results and compete for the best project awards. Many European projects include competitions in their programmes as a way of attracting teachers to try their materials in class and provide feedback.

In this round table, two science fair representatives and two project competition winners will share their experiences and challenges when organising these fairs and participating in competitions, respectively. Questions like "What are the main challenges?", "What are the benefits for teachers and students?, "Do these activities encourage more students to go into STEM research careers?" will be addressed.

Speakers:

- Susana Chaves (Fundação da Juventude, Portugal)
- Marjaana Myllyla (School of Riihenmäki, Mäntsälä, Finland)
- Carlos Ribeiro (Agrupamento de Escolas Marinhas do Sal, Portugal)
- Ercan Torun (Inespo, Cosmicus), Netherlands)

## RT7) Science education and gender as part of RRI

**Yves Beernaert (EDUCONSULT, Belgium)**

Responsible Research and Innovation (RRI) has been around for a number of years and means different things to different people, but it can essentially be summed up as: "doing science and innovation with society and for society." In other words, it aims to make the practice and end products of innovation and research meet the needs and values of the people they will ultimately affect. You and me, in fact.

RRI is an inclusive approach that the European Commission takes very seriously and has therefore promoted it as part of several European Framework Programmes. As of June 2014, there were at least a dozen international research projects, most of them funded or co-funded by the EC, that were involved in developing a Responsible Research and Innovation governance framework.

Participation is a key aspect of RRI, which aims to involve everyone affecting and affected by research and innovation. A properly working model of RRI brings together multiple actors, such as researchers, citizens, policy makers, businesses and educators, to cooperate during the whole research and innovation process. In this month's newsletter, we'll be taking a look at RRI, what it is, what it means in practice and how you can be part of it.

Two of the key action points for RRI are promoting gender equality in research and innovation, and the importance of science education in connection also with research and innovation.

In this round table, experts in research, RRI and gender in education will be discussing from their point of view the importance of science education and the promotion of gender equality in education and STEM careers.

Speakers:

- Amber Gell (Lockheed Martin / NASA, USA)
- Tricia Jenkins (University of Liverpool, United Kingdom)
- Rosina Malagrida (IrsiCaixa, Spain)
- Maria Korda (European Commission, Belgium).


Scientix is managed by European Schoolnet (EUN) under the European Union's 7th Framework Programme. EUN is a consortium of 30 Ministries of Education in Europe. Since its founding in 1997, it has become one of the key organisations in driving innovation in teaching and learning, and fostering pan-European collaboration of schools and teachers. It is based in Brussels, Belgium.
www.eun.org, Rue de Trèves, 61 | 1040 Brussels, Belgium.

Contact Scientix – scientix@eun.org – www.scientix.org – www.twitter.eu/scientix_eu

Acknowledgements
Scientix is supported by the European Union's Seventh Framework Programme for Research and Development (FP7). This publication reflects the views only of the authors and does not represent the opinion of the European Commission, and the European Commission is not responsible or liable for any use that may be made of the information contained therein.