Educational Portals
Examples and Practices

Sofoklis A. Sotiriou and Emmanuel Chaniotakis

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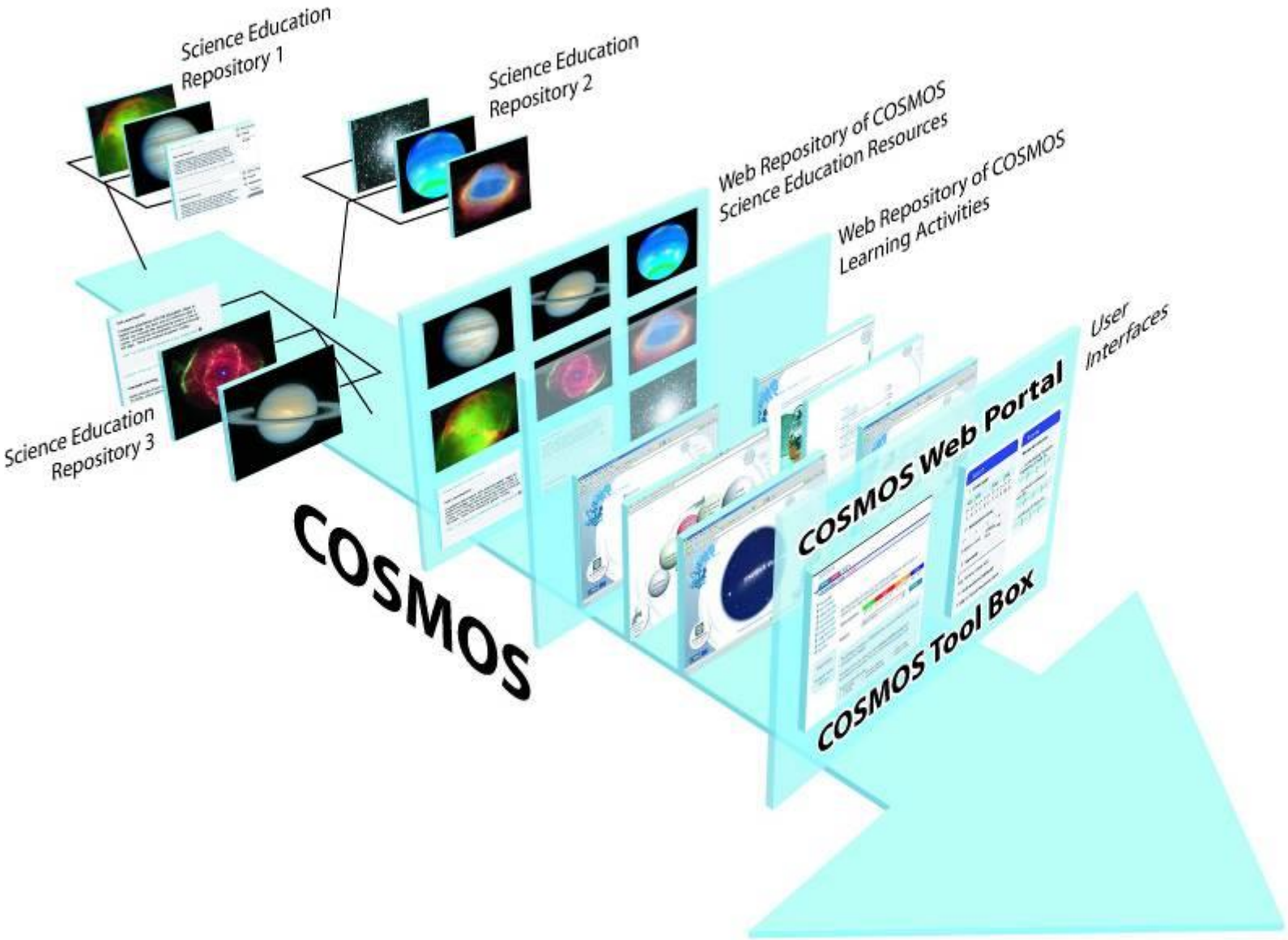
Presentation Overview

- Tools and Data Repositories, Educational Portals and Content Aggregators
- Search Mechanisms
- Community Support Environments
- Authoring and Content Enrichment Tools
- Users support
- Monitoring and Impact Assessment
- Conclusions



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unification of the existing tools and on-line materials

My D-Space

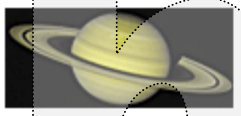
The Sun
- Sun as a star *(3)* ***view***
- Solar Rotation *(3)* ***view***

Planets and Moons
- Characteristics of a Planet *(30)* ***view***
- The Characteristics of the Surface of the Moon *(44)* ***view***

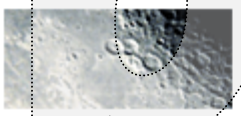
Asteroids
- Characteristics of Asteroids *(1)* ***view***
- Rotation of Asteroids *(1)* ***view***

Birth and Death of Stars
- Birth of Stars *(9)* ***view***
- Death of Stars *(8)* ***view***

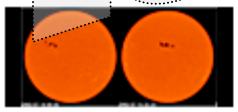
Galaxies
- Characteristics of Normal Galaxies *(56)* ***view***



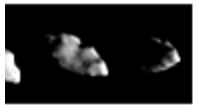
1. Measuring the size of Saturn's Rings



2. Measuring the height of the Lunar Craters

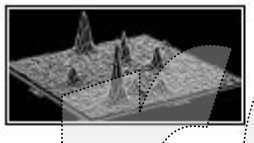


3. Measurement of the Solar Rotation

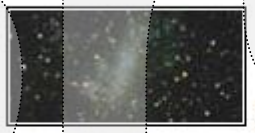


4. Determination of Asteroids Rotation Periods

Universities



1. CCD image analysis



2. CCD photometry

3. Colour in astronomy

4. Detection of binary stars

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COSMOS Portal - Windows Internet Explorer

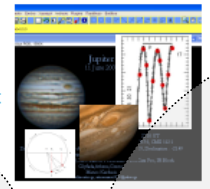
http://147.102.107.69/cosmos/repository/

COSMOS Portal

COSMOS Repository

The COSMOS Portal contains educational material in the form of **educational content** (photos, videos, animations, exercises, graphs, links) and of **learning activities** (structured lesson plans organized according to specific pedagogical models according to the IMS Learning Design specification). Users can search for the educational materials in the "Explore COSMOS" section or to upload their own materials to the COSMOS Repository, using the "Share your Content" section. The "Go Observing" section offering the opportunity for the creation and development of new content based on astronomical observations that could be realized through the network of the COSMOS robotic telescopes.

Explore COSMOS



- Search for Educational Content
- Search for Learning Activities

Share your Content

- Upload Educational Content
- Upload Learning Activity

Go Observing!

Discovery Space National Schools' Observatory

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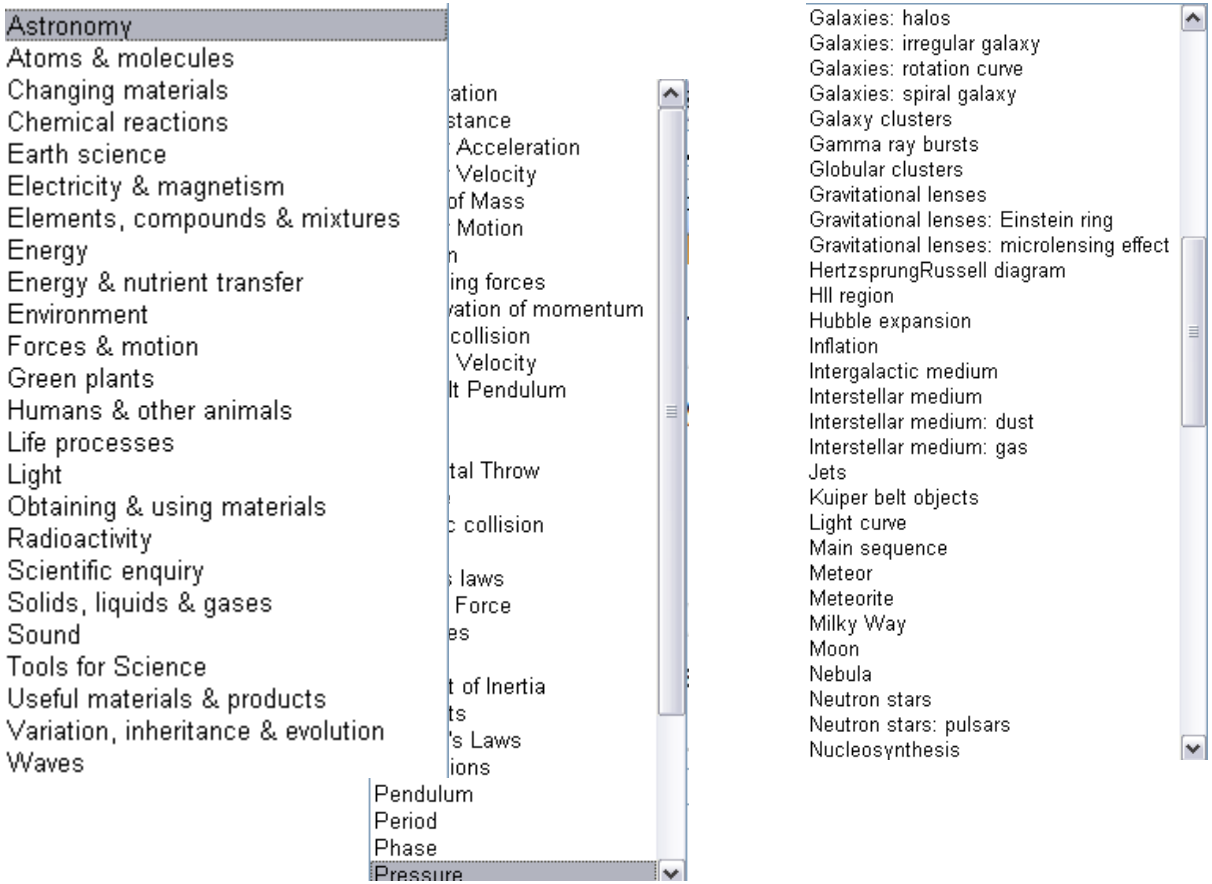
Organized according to the science curriculum



24 categories with overall 424 terms for several science ects (mechanics, astronomy, E/M, waves,…)

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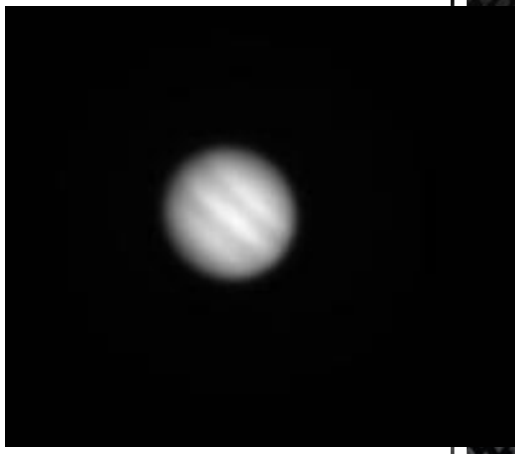
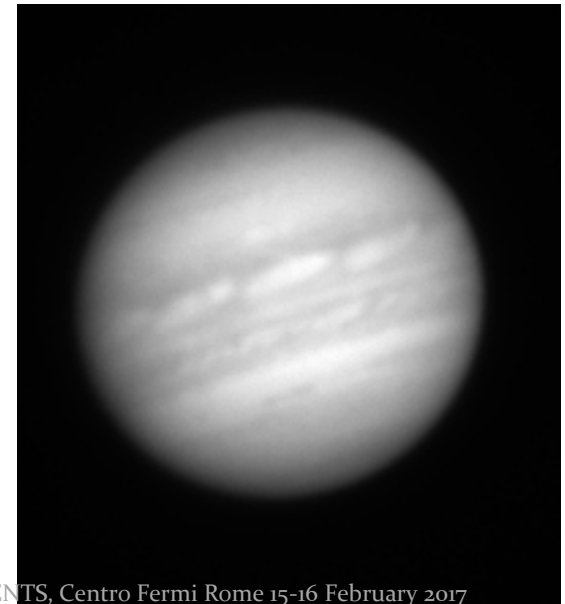
Access to Real Data…





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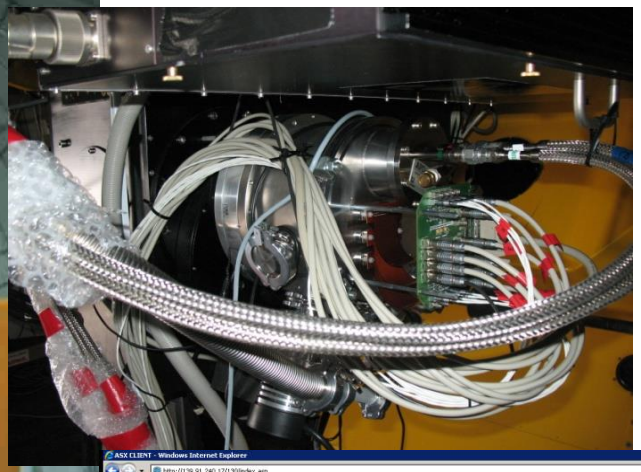
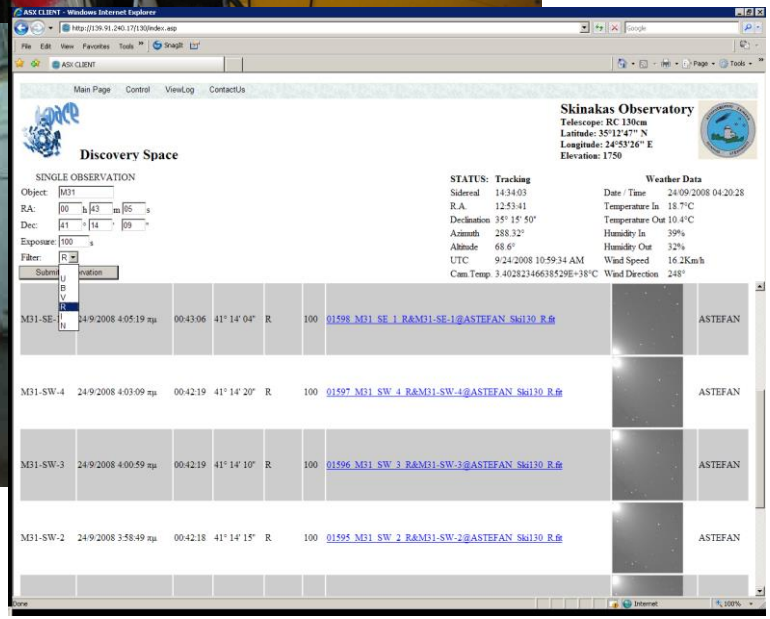
…advanced infrastructures…





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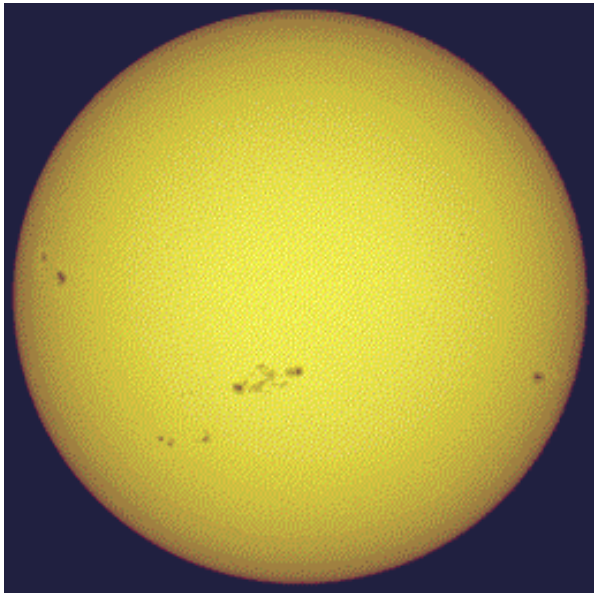
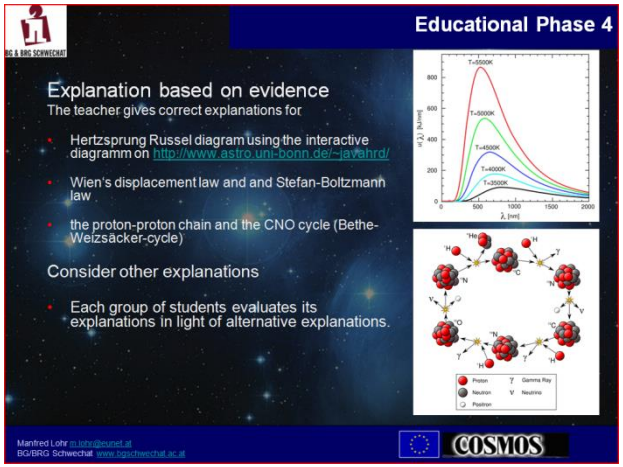
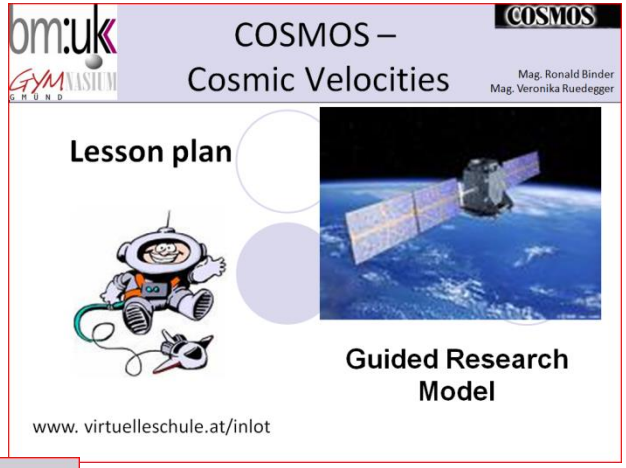
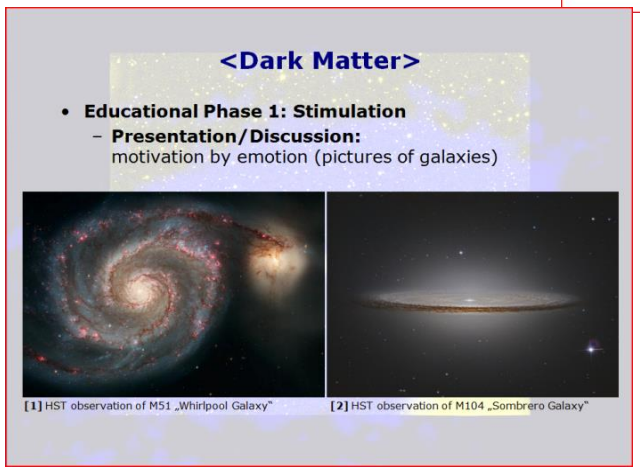


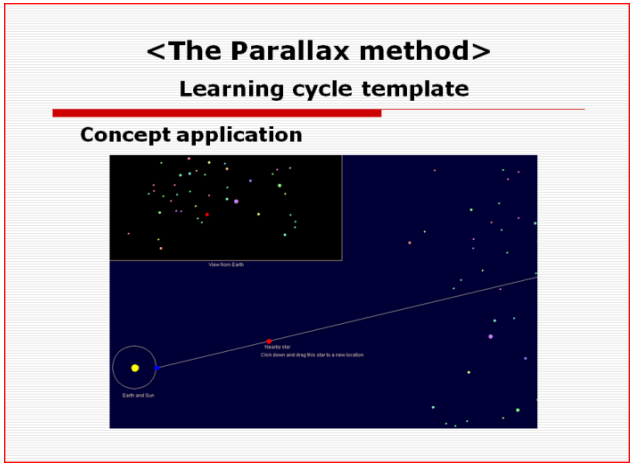
...and high quality content

User Generated Content…









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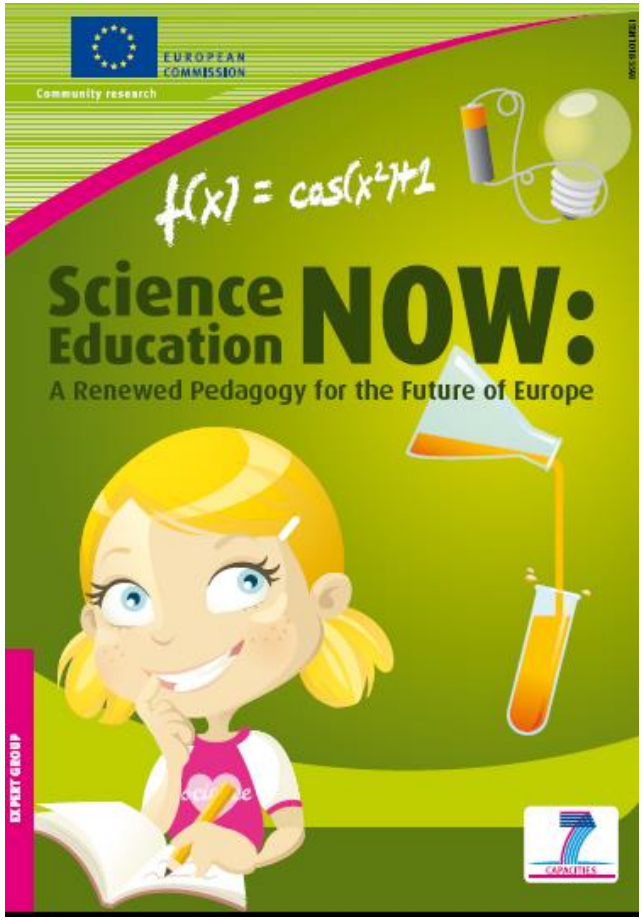
...developed according commonly used educational approaches...



COSMOS Scenarios Templates

Name
Guided Research Model
Inquiry Based Teaching
Project Based Learning
The 5E Instructional Model
The Learning Cycle
ICT Cross Culture Awareness Learning

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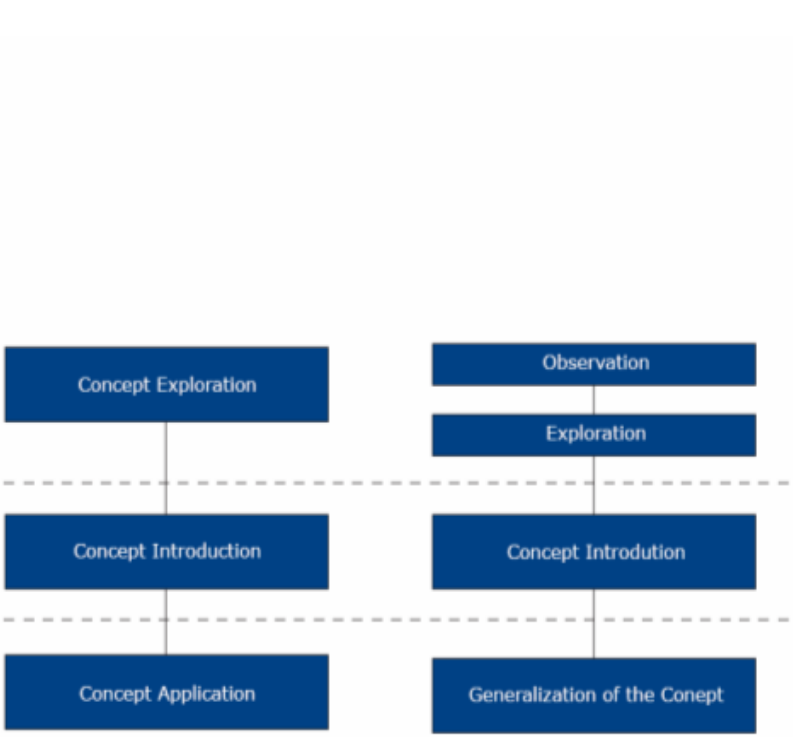
...Organized in meaningful activities...



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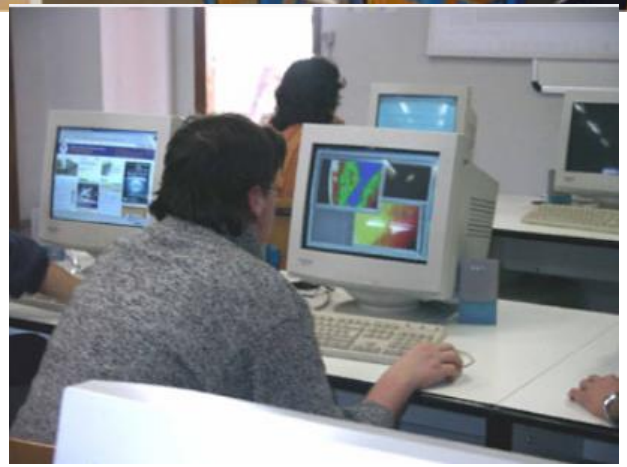
...Tested in Real Environments



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Tools and Data Repositories, Educational Portals and Content Aggregators

Tools Repository
Discovery Space

INTERNATIONAL YEAR OF ASTRONOMY 2009
LOG IN
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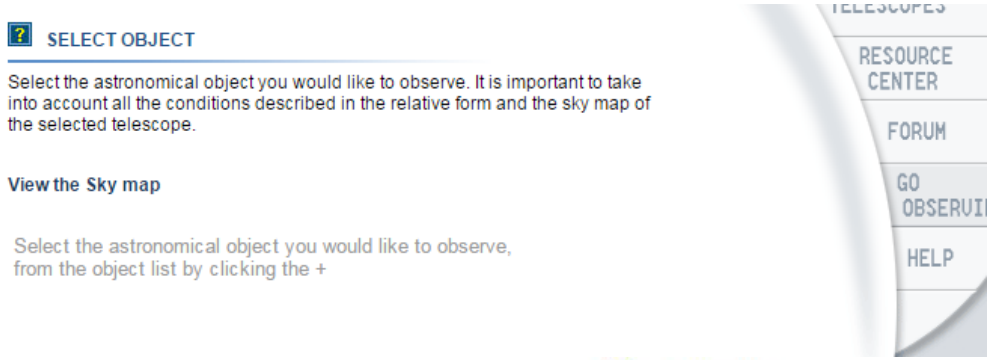
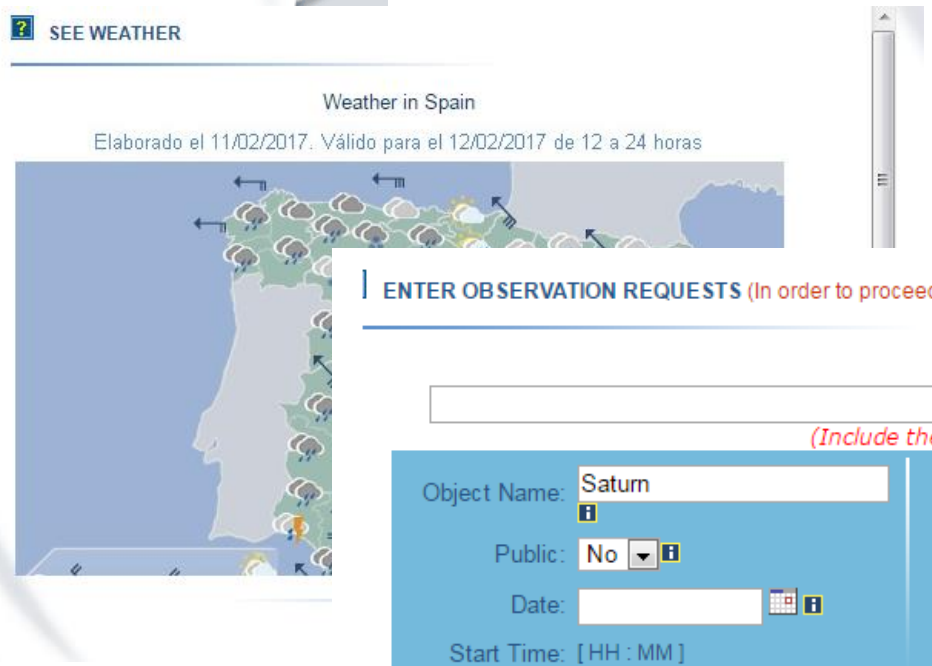
RESOURCE CENTER
FORUM
GO OBSERVING
HELP
Home > Go Observing
GO OBSERVING
There are two ways of observing the sky. Advanced and experienced users can remotely operate a telescope in real time. All the others can submit their requests, which will be scheduled forthe oncoming nights.
Select your way of observing
• Submit your scheduled requests
Submit your observational requests in four steps: Select a telescope, select an astronomical object, check the weather and fill in the details like date, filters, duration, etc, click here to continue.
• Remotely operate a telescope in real time
You can operate Skinakas telescope in real time by giving the coordinates of the object you wish to shoot, and the telescope immediately starts moving to fulfil your request. To become an authorized user, download and fill-in the application form. Send your CV and the application form to the Scientific Committee of D-Space. If you are selected, the Scientific Committee will contact you in order to give you the username and password for a specific date. If you are already authorized, .
HOSTING
100 HOURS OF ASTRONOMY

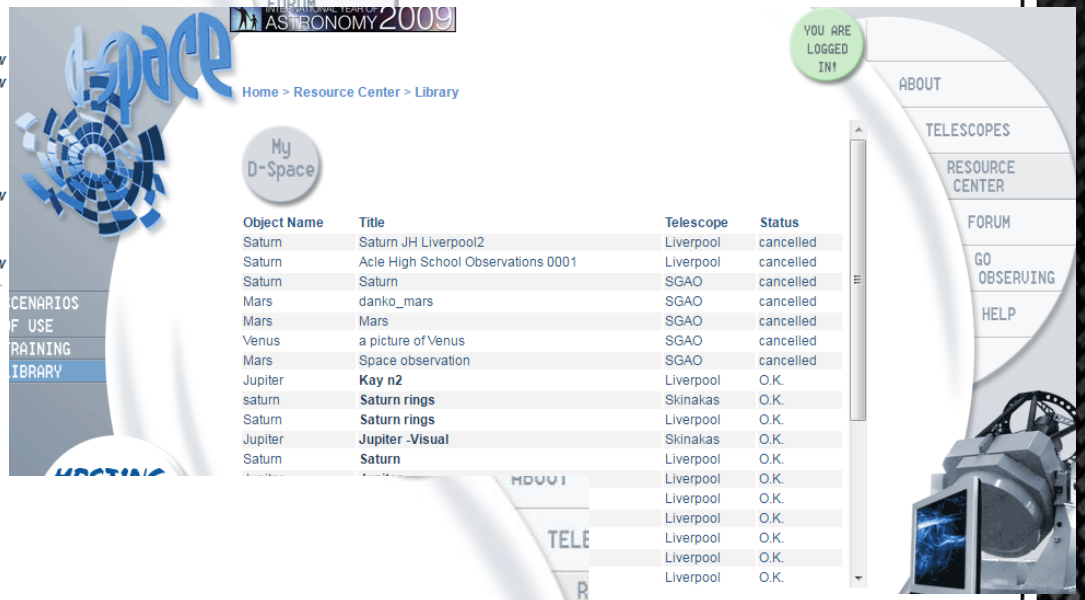
Available Telescopes

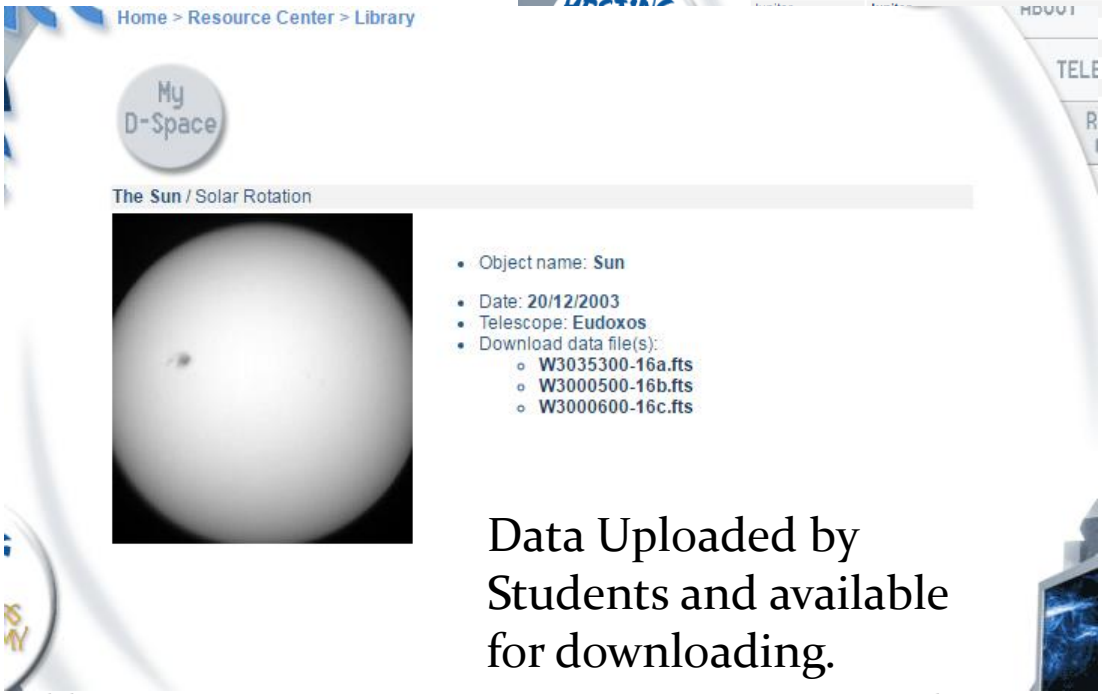
How to make an observation





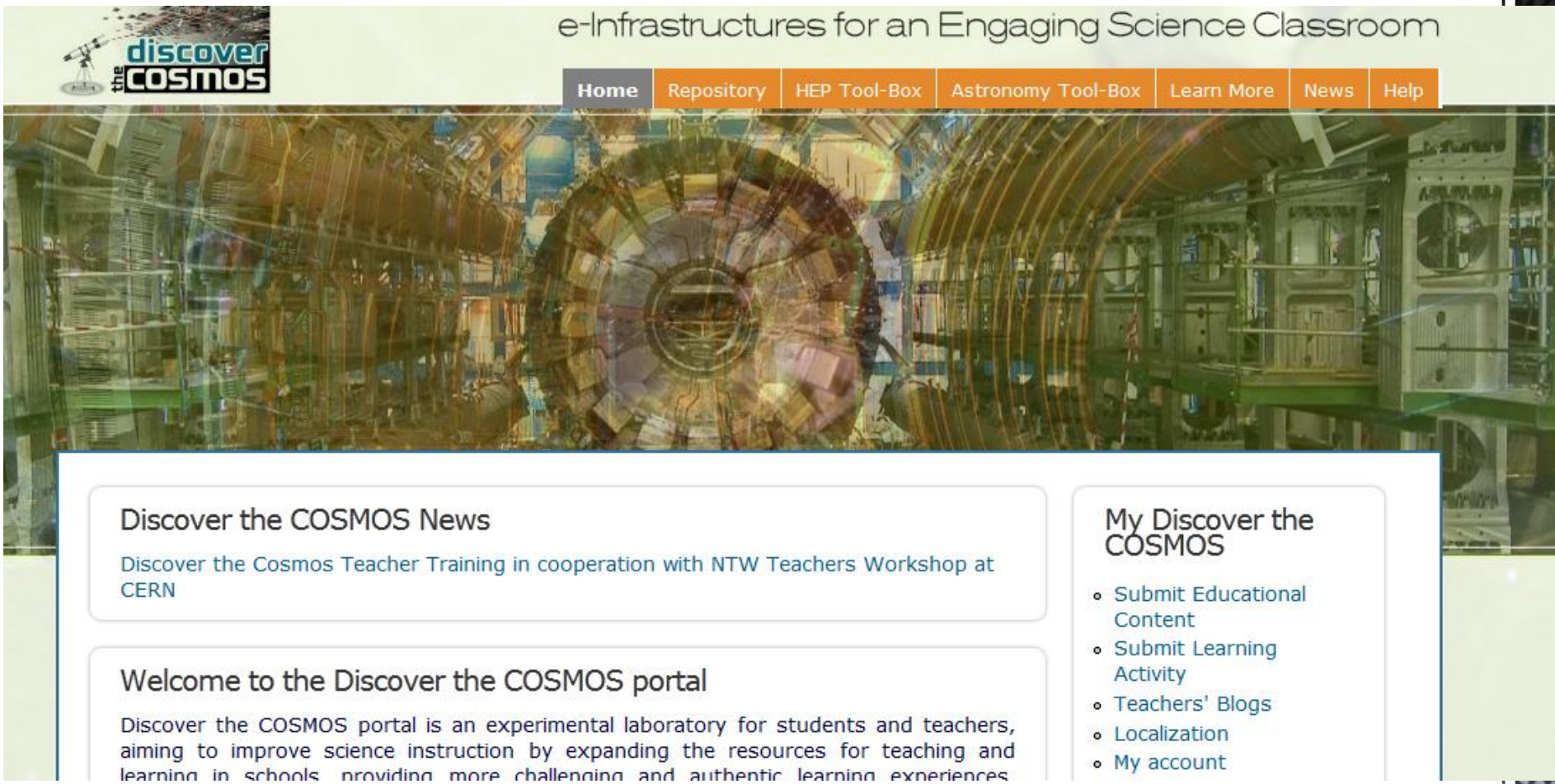
Observations





Data Uploaded by Students and available for downloading.

Educational Portal
Discover the COSMOS

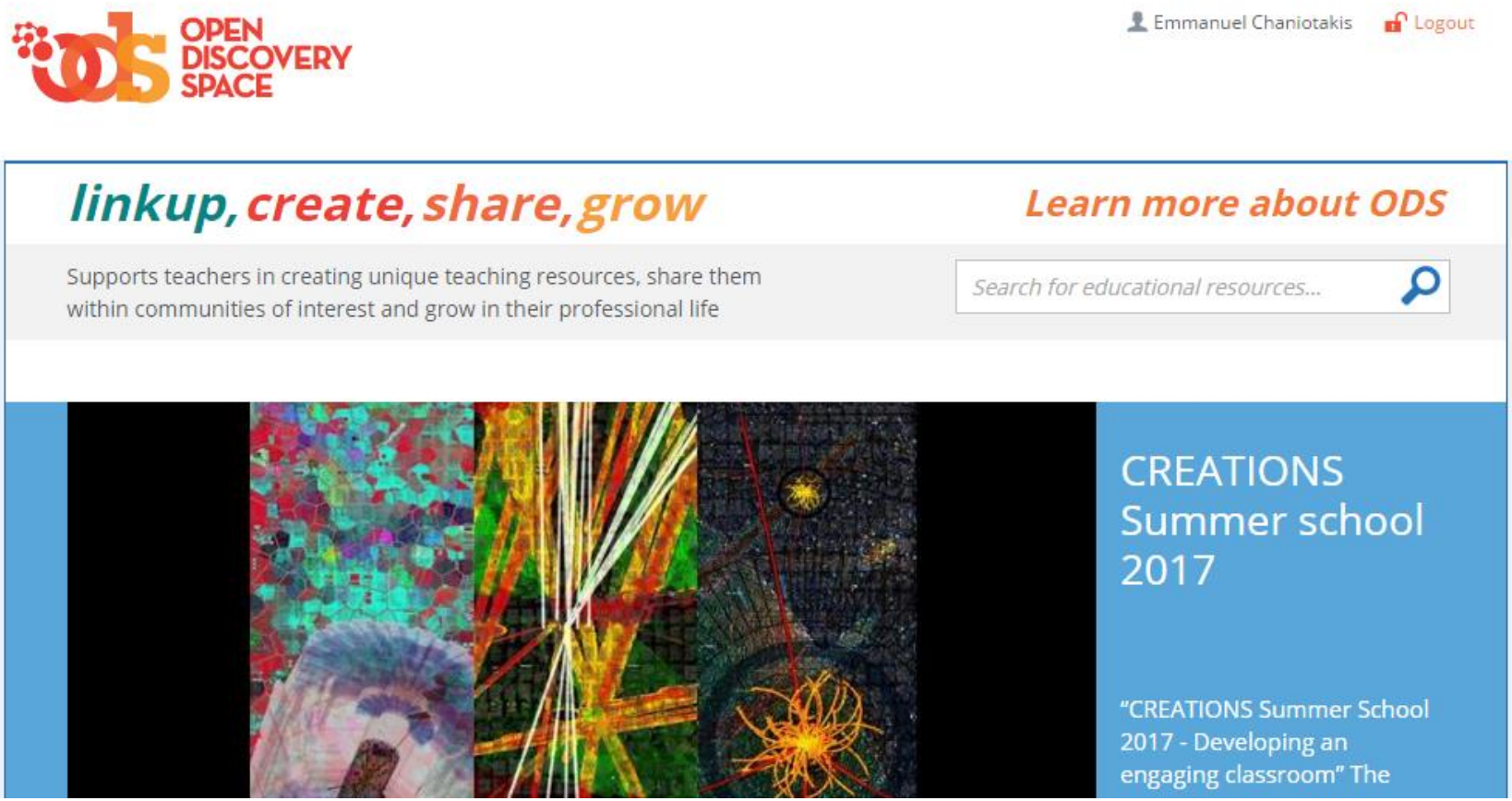


629 educational scenarios

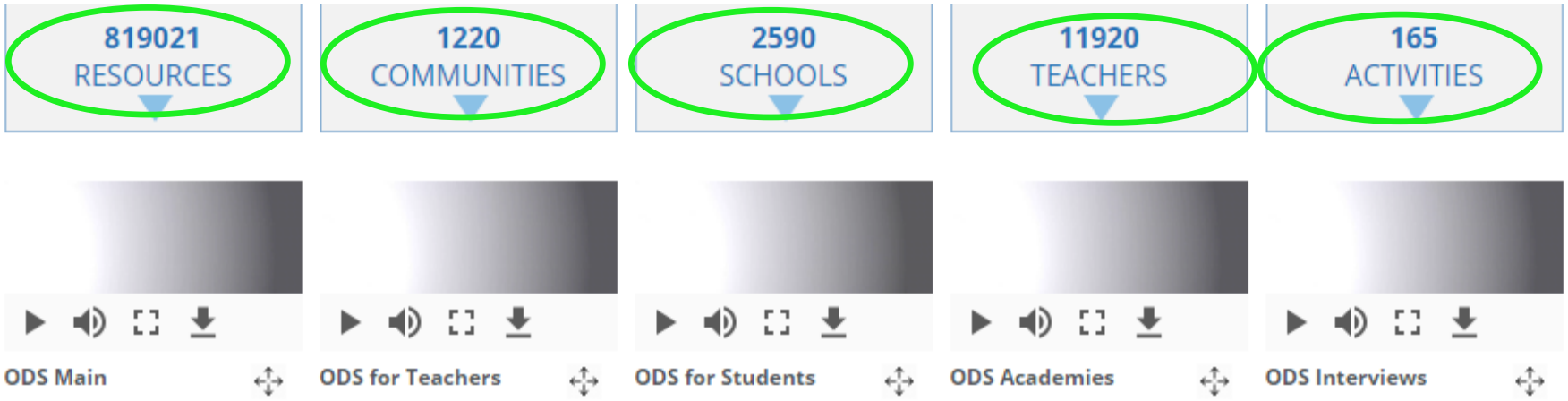
92709 educational resources

http://portal.discoverthecosmos.eu

Content Aggregator
Open Discovery Space



http://portal.opendiscoveryspace.eu

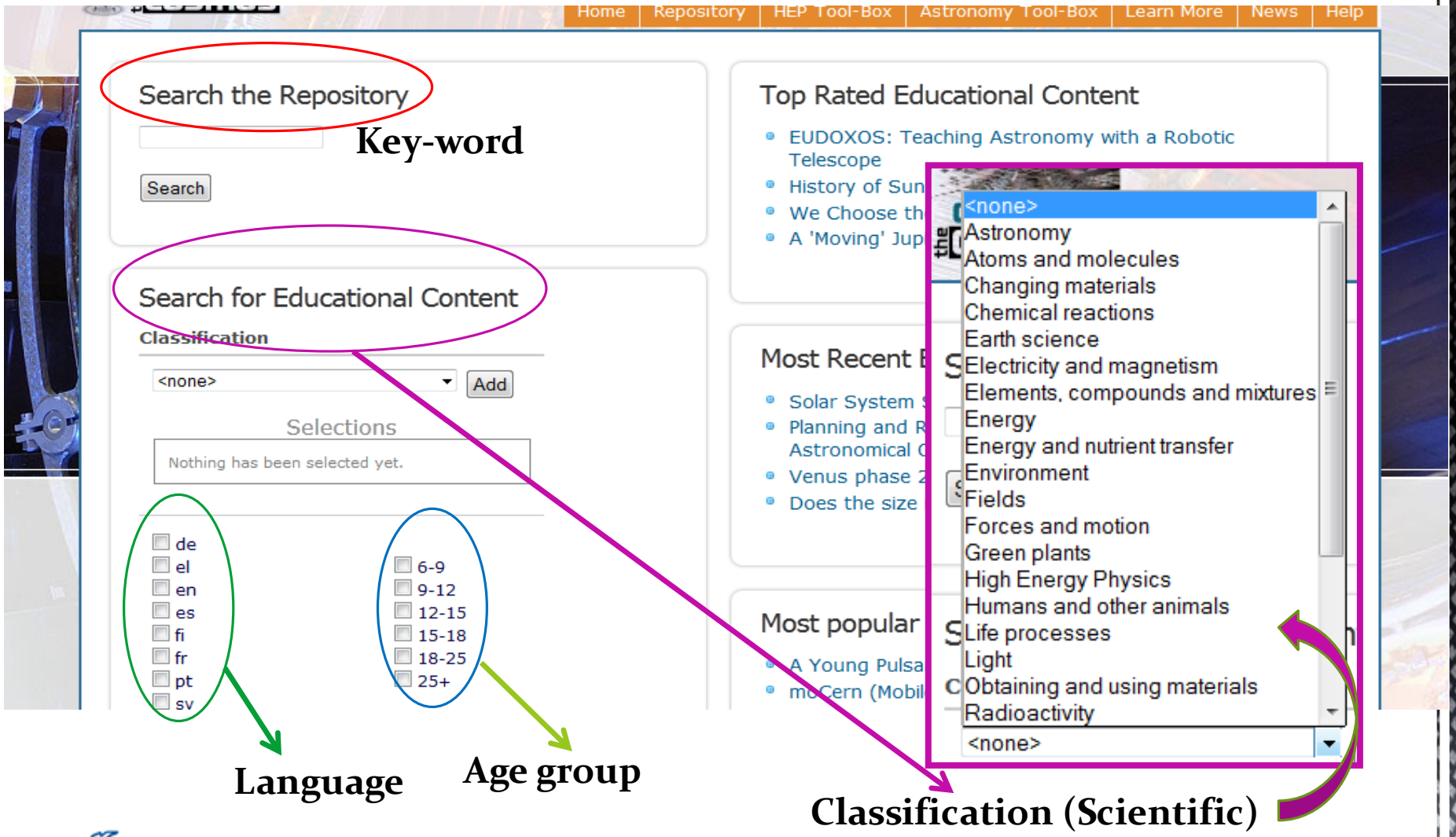

819021
RESOURCES
1220
COMMUNITIES
2590
SCHOOLS
11920
TEACHERS
165
ACTIVITIES
ODS Main
ODS for Teachers
ODS for Students
ODS Academies
ODS Interviews

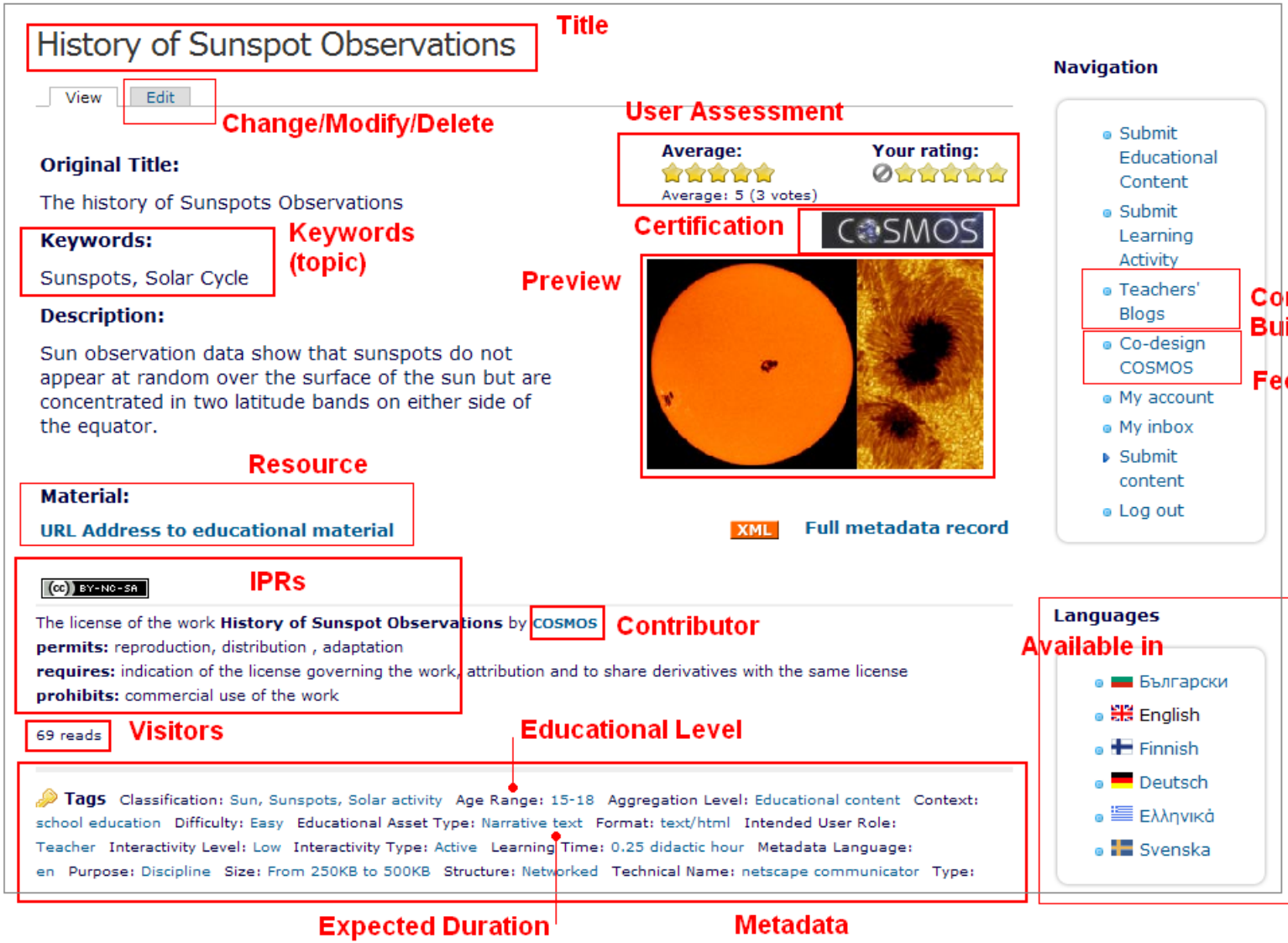
NEWS
40 high school students...
Friday, July 22, 2016
Following a successful Inspiring Science Education Summer...
Last places available...
Monday, June 20, 2016
A small number of places are still...
ISE Webinar: Light...
Monday, June 20, 2016
Title: Light Pollution Scenario Date and time:...
COMMUNITY EVENTS
"When dinosaurs...
Friday, February 3, 2017
Starting this Friday 3rd of February and for the...
First meeting of the...
Wednesday, March 1, 2017
The first meeting of our Action Research...
CMS Virtual Visit
Monday, March 6, 2017
We are happy to announce that we will be hosting...

Search Mechanisms

Search Mechanism: Discover the COSMOS

Searching Educational Content with





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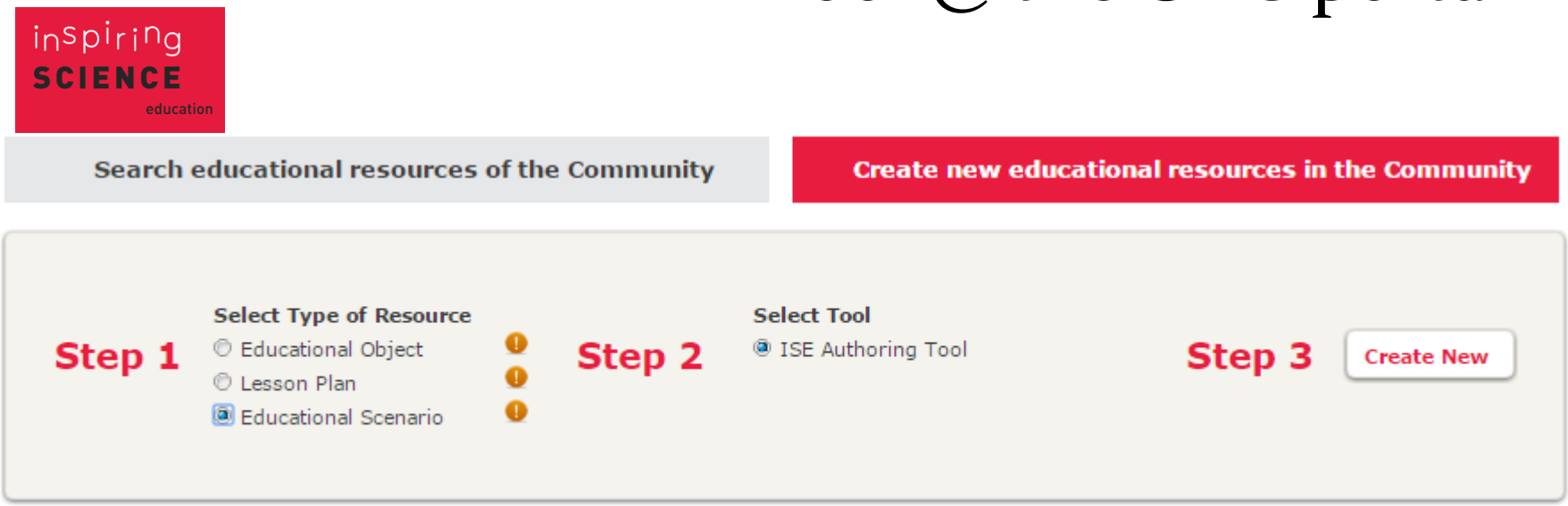
Authoring and Content Enrichment Tools

Creating and Uploading Educational Content:

The Inspiring Science Education Authoring Tool @ the ODS portal



5 phases of IBSE in educational Scenario

iSe Hi User! ASSESSMENT SETTINGS HELP

LIGO AND THE QUEST FOR GRAVITATIONAL WAVES

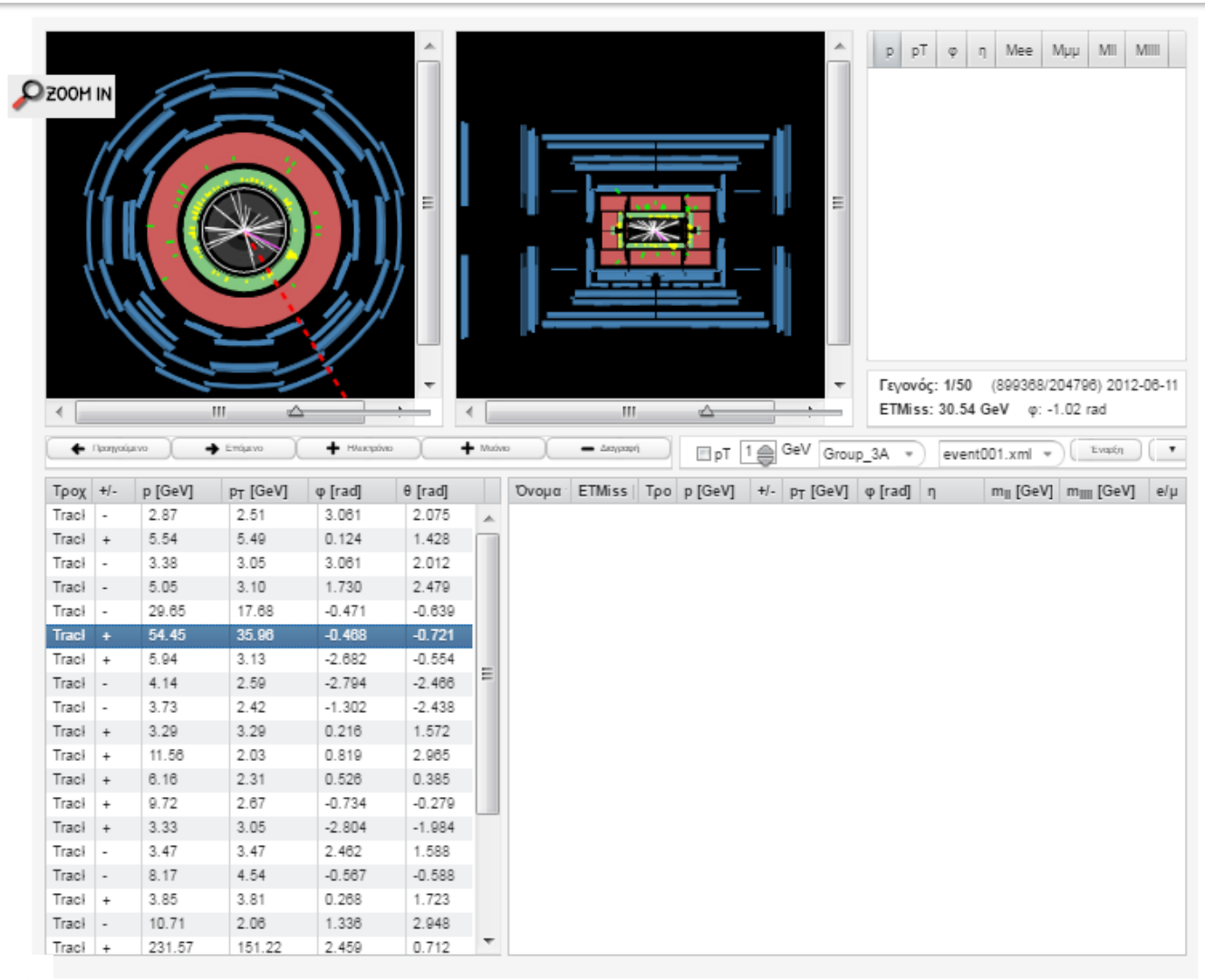
ORIENTING & ASKING QUESTIONS | HYPOTHESIS GENERATION & DESIGN | PLANNING & INVESTIGATION | ANALYSIS & INTERPRETATION | CONCLUSION & EVALUATION

LISTEN CONTENT

Orienting: Provide contact with the content and/or provoke curiosity

In February 11, 2016 a major scientific discovery was announced by the LIGO collaboration in USA. 100 years after the conception of Einstein's theory of General Relativity which describes the force of gravity in a new perspective, humankind comes to observe its greatest verification!
1.3 billion light years away, 2 gigantic black holes with masses almost 30 times the mass of the sun each travelling at speed close to the speed of light collided creating a cataclysmic cosmic event.

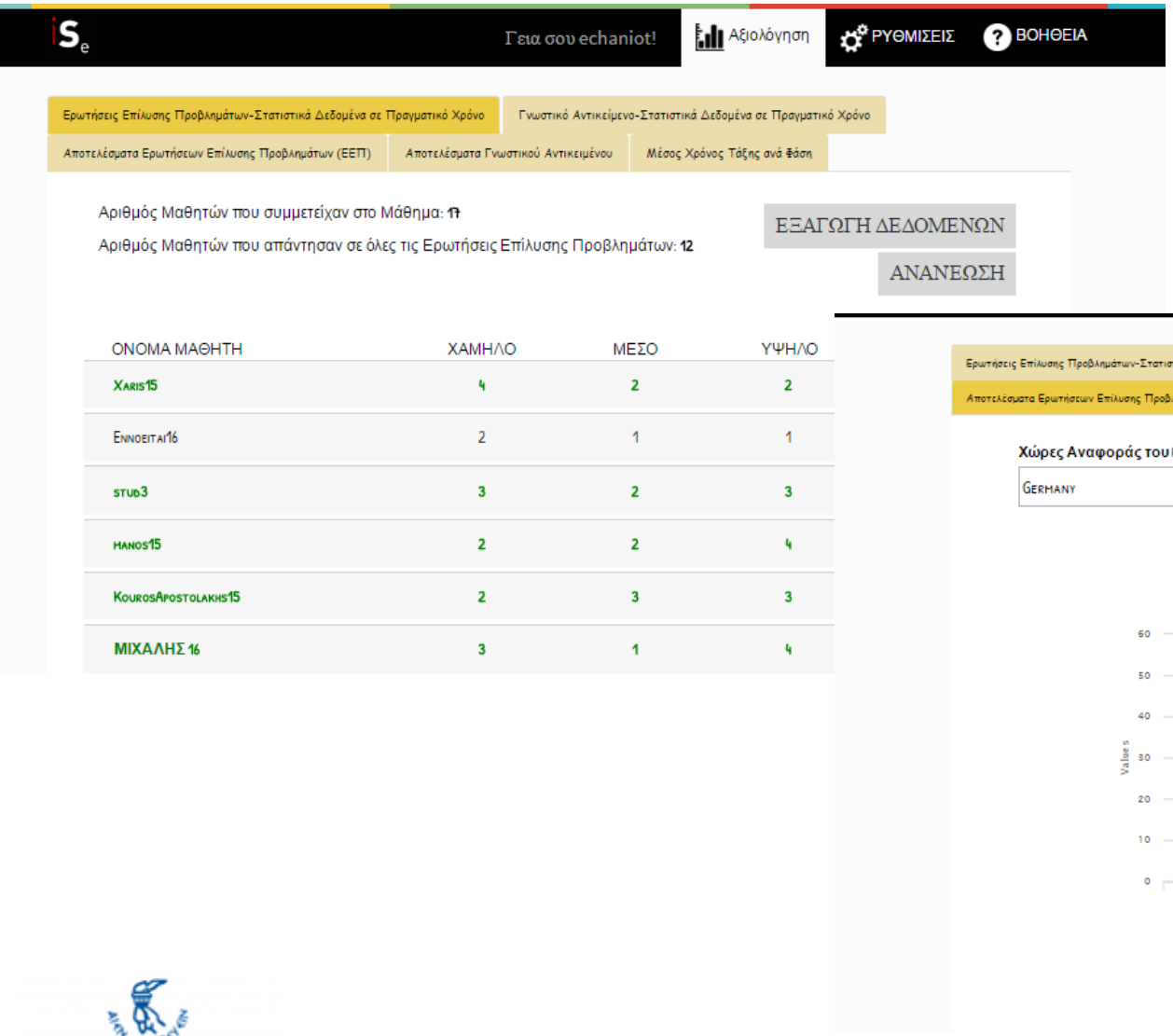
Embedding virtual e-science applications

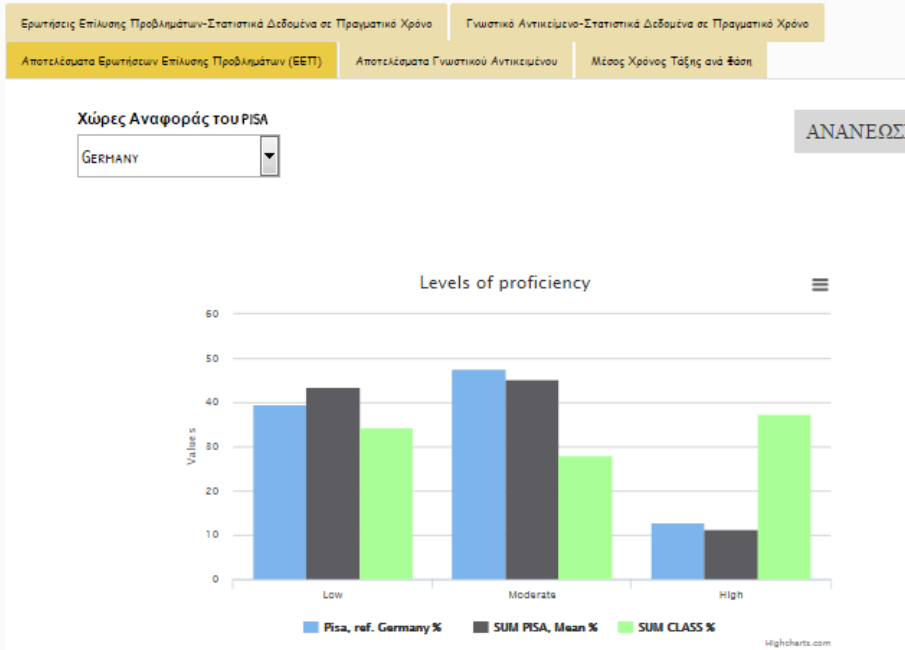


Στο πάνω μέρος της οθόνης παρουσιάζονται δύο όψεις του ανιχνευτή: Αριστερά μία εγκάρσια τομή του ανιχνευτή (κάθετη στις δέσμες)

Online assessment

Assessing Problem Solving Skills and Knowledge Items

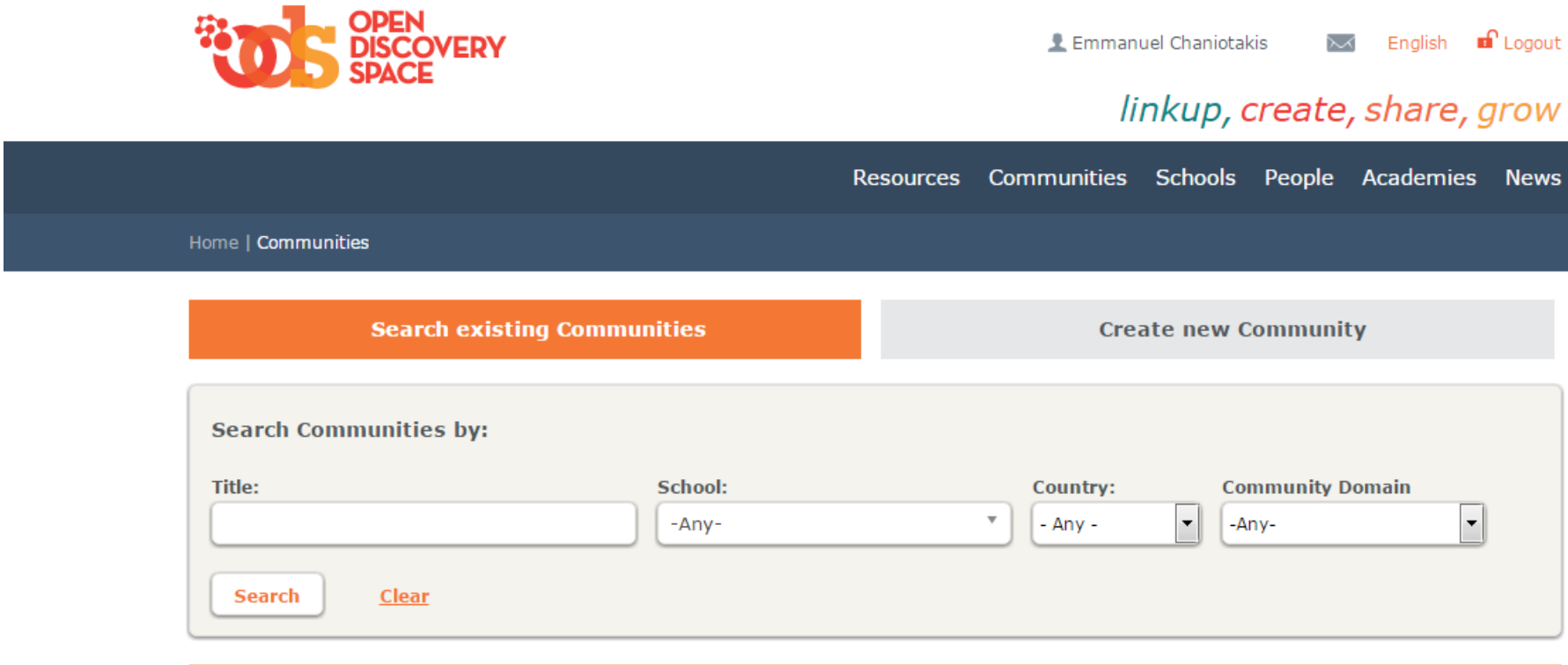




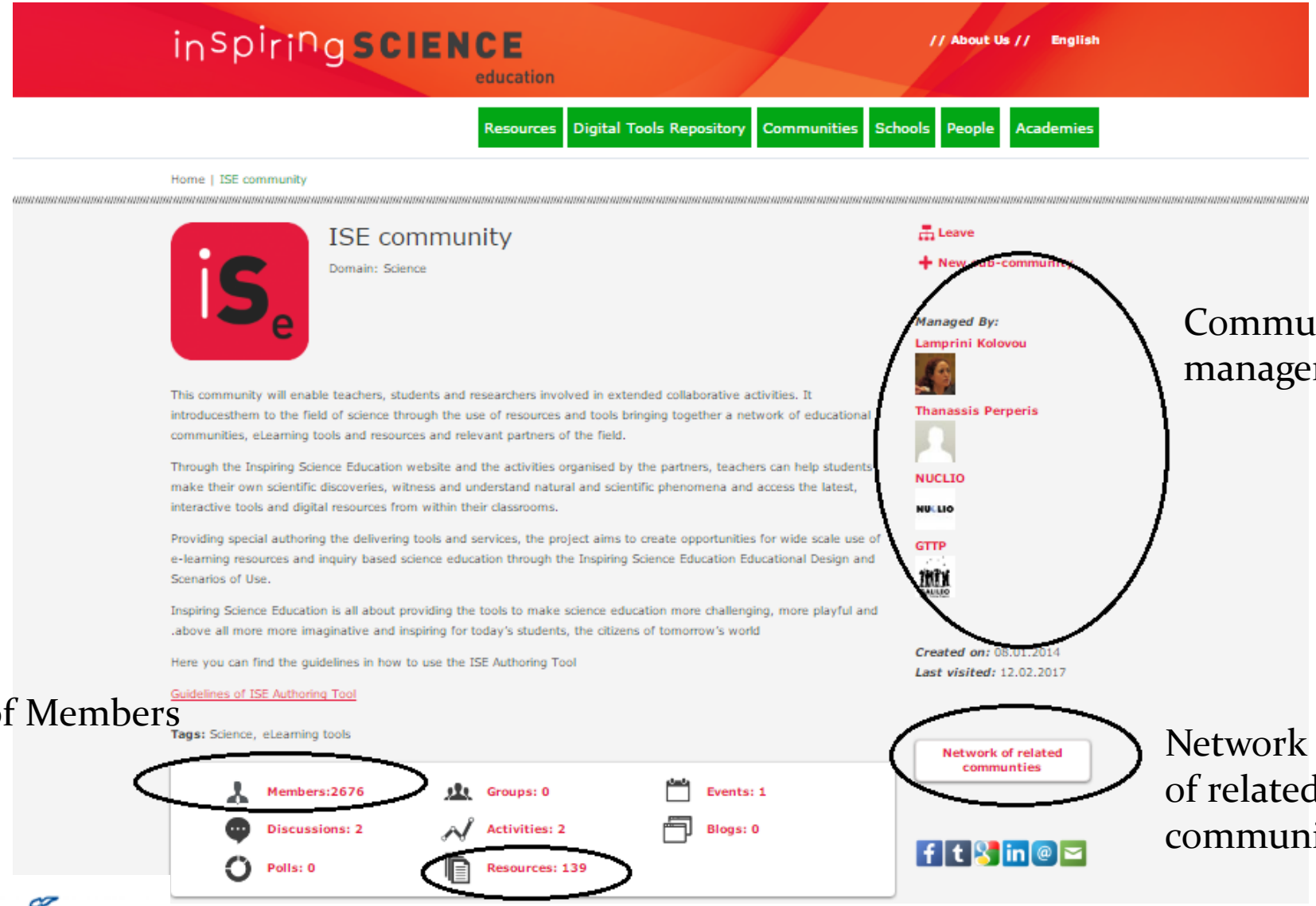
Community Support Environments

The Open Discovery Space Community Support Environment: More than 1200 online communities as of now

http://portal.opendiscoveryspace.eu/communities



Example of a community: ISE community



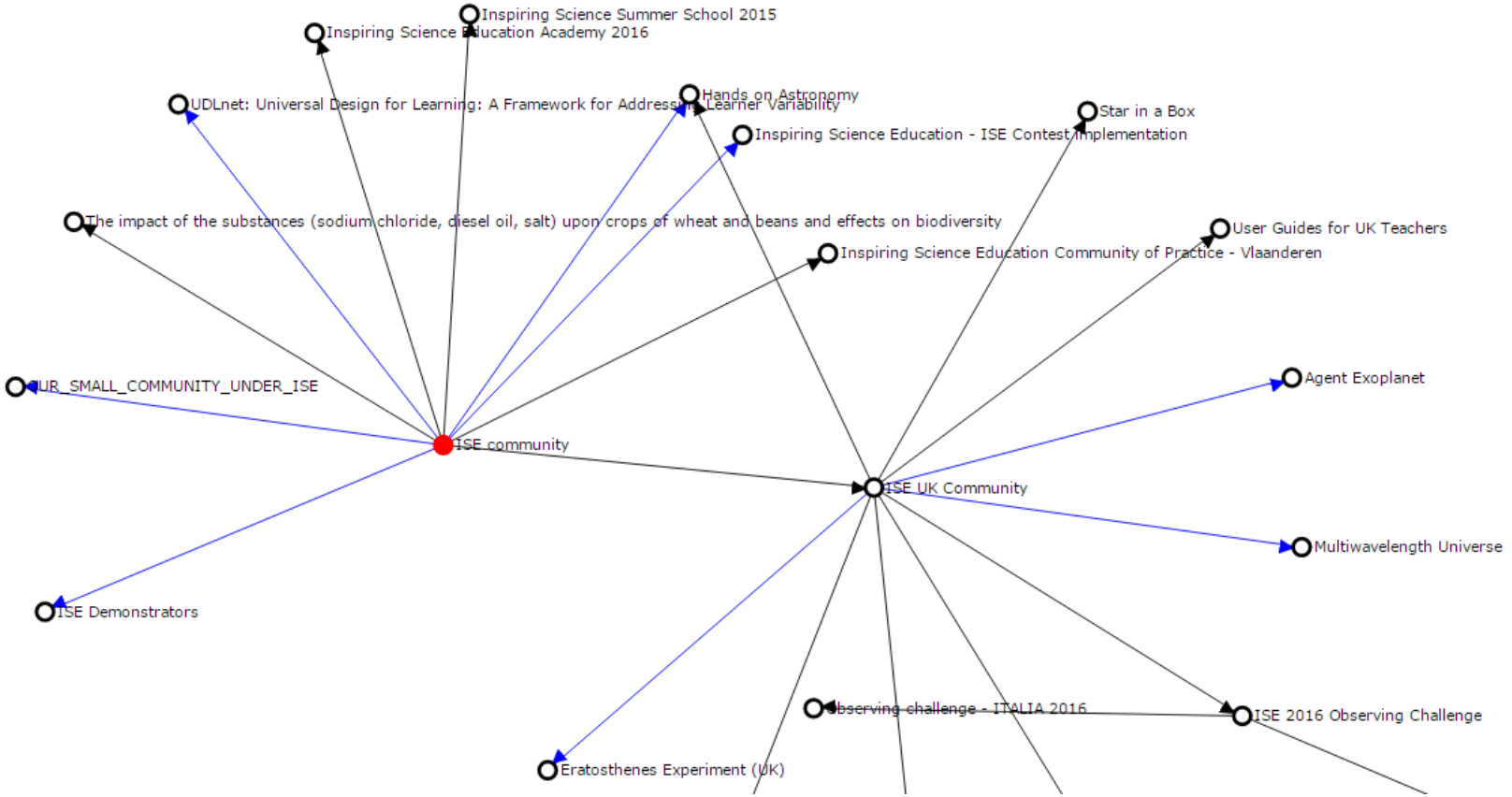
Community managers

Nr of Members

Network of related communities

Nr of Resources

Communities can relate to each other:
Network of Related Communities and Exchange of educational practices.



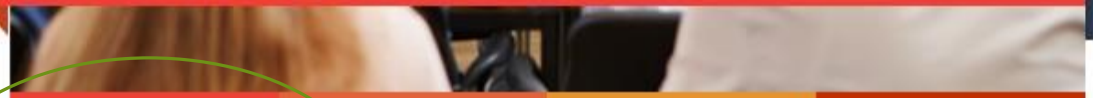
Users support

Training Academies

Teachers Academy

Welcome to Teachers Academy! This training framework is targeted to both non-technically oriented teachers as well as to IT-coordinators.

read more +



teachers academy | eParents academy | content providers academy | technology developers academy

Welcome to the ODS Training Academies

Within the **ODS Training Academies**, we use the term "training" to refer to the acquisition of knowledge, skills, and competencies in the area of ICT and OER. In this context, references made to the field of professional development and to the field of professional learning should be understood as the perspective solutions to the practical problem of transferring knowledge from one part of the professional community to another part of the professional community. ODS training activities seek to organize, create, capture or distribute knowledge and ensure its availability for users. The ODS training program offers both live and online training and knowledge transfer opportunities.

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info@esea.ea.gr
inspiring SCIENCE
European science education academy
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HOW TO APPLY
CONTACT
The Mars mission
Creations
Let's go STEM
Go-Lab
Stories of tomorrow
Discover the Cosmos
ARK of Inquiry
CEYS
inspiring SCIENCE
European science education academy
INSPIRING SCIENCE EDUCATION ACADEMY 2017
ASTRONOMY ADVENTURES IN CANARY ISLANDS
ESA - GTTP WORKSHOP
SCIENCE THROUGH SPACE & TIME
BEYOND EARTH ORBIT
ESEA has published the training courses for 2017!
Read more
Register now!
CHOOSE A COURSE
Find what interests you

Example: The Inspiring Science Education Academy

http://portal.opendiscoveryspace.eu/topic-courses/inspiring-science-education-academy

Home | Training Academies | Teachers Academy | Inspiring Science Education Academy

Inspiring Science Education Academy

Inspiring Science Education Academy

The aim of the Inspiring Science EducatioAcademy is to support the modernisation of Science education and training, including in curricula, assessment of learning outcomes and the professional development of teachers and trainers, and to the wide adoption of the recommendations of the Rocard Report "A new Pedagogy for the Futur the introduction of the Inquiry Based approach in the science curricul familiarized with a unique collection of open digital educational resources pedagogical practices, such as using real world learning activities, imple order to design educational scenarios by repurposing existing eLearning t with a broad range of curriculum areas, do not impose a fixed curriculu location and culture, as well as cross-disciplinary situations, being thus i instruction. Teachers will also be trained to appropriately select and exploi their educational scenarios that suit their own needs in terms of plannin their classroom and organizing the curriculum. This will further empower classroom, as well as in multiple environments such as face-to-face, comprehensive open learning networks approach that allows teachers to and collaborate is expected to enable all stakeholders to examine their ow

Choose an Academy

About Available Courses

Connecting Schools to Science Centres and Museums

Description:
Science museums and science centres are popular informal learning spaces. They play a prime role in public engagement in science enabling people to have first-hand experience of scientific phenomena and to develop curiosity, awe, motivation, interest to know more, understanding and learning. Science museums are also actively involved in school education providing a range of activities for pupils, offering resources and specialist support to teachers and organising training initiatives for school staff. In particular, school groups are among the audiences most present in the majority of museums as well as, in many cases, the priority of museum education services.

Training Activities: 15

School Based Inquiry Activities

Description:
The school constitutes the "epicentre" of formal comprehensive education. Most processes and educational models start there and revolve around the work carried out within its walls. Naturally, the same applies for activities involving the IBSE model, generally acknowledged as one of the most effective teaching approaches; the students start their acquaintance with inquiry-based learning at school, with the help of their teachers. Therefore, schoolbased work on the IBSE constitutes the cornerstone upon which any further activities can be built.

Training Activities: 16

Connecting Schools & Scientific Research

Description:
Research Centres are the places where "things happen" in Science. New observations are made, new ideas are proposed, new models are tested. Clearly, from the viewpoint of excitement, a Research Centre is the place to be: Research Centres play an increasing role in the advancement of knowledge and technology. Because of their ability to assemble a 'critical mass' of people and investment, they contribute to national, regional and European economic development.

Universal Design f
Learning

General Resources

- User Profile
- Create Community
- Create Modules Inside Community
- Join Community
- Manage Community
- Registration
- Share Resources in Com
- Badges

How to become an OD school PDF (2,4MB) PPTX (

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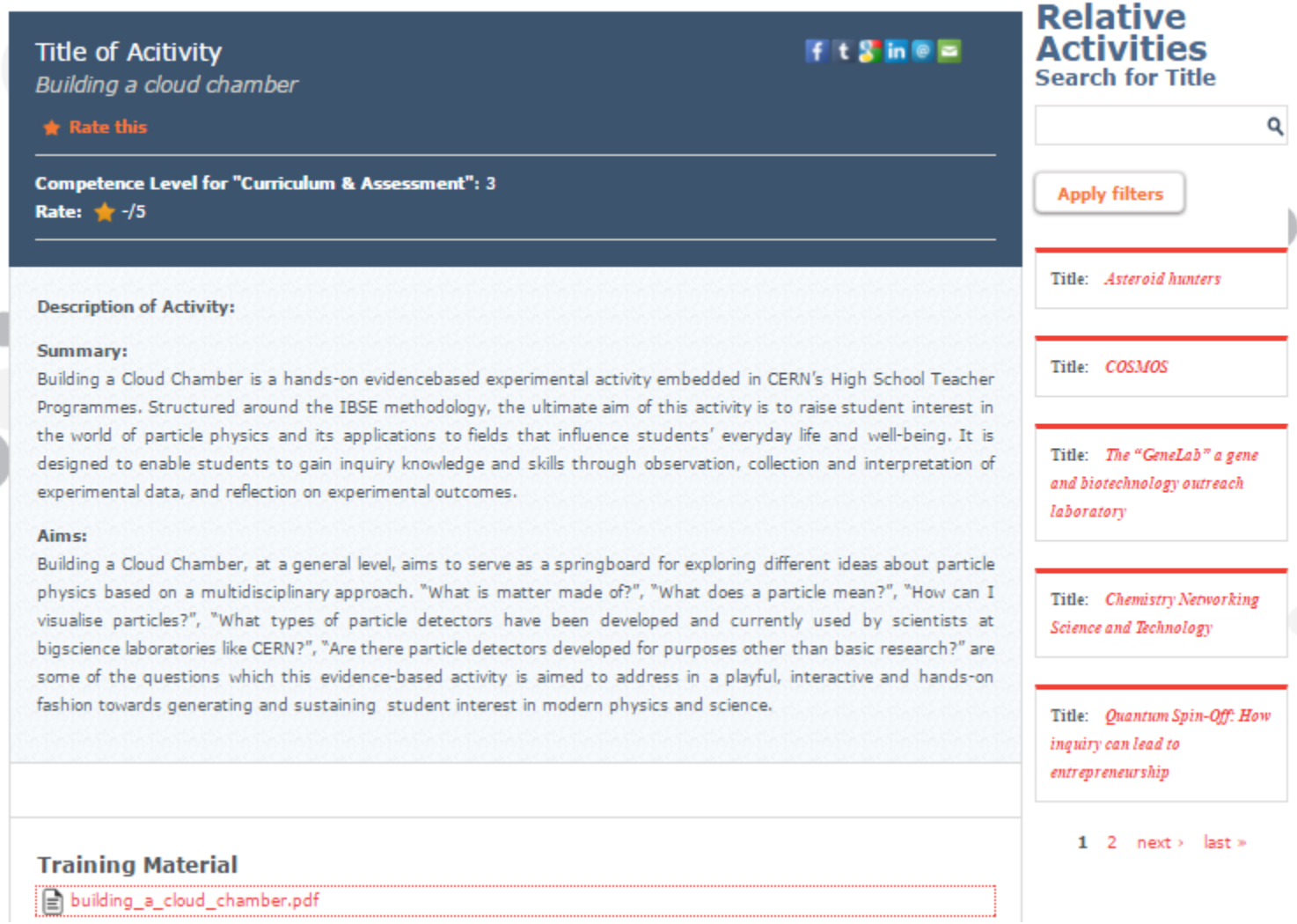
Example of Teacher Training Activity: “Building a Cloud Chamber”



Title of Acitivity

Building a cloud chamber

Rate this

Competence Level for "Curriculum & Assessment": 3

Rate: -/5

Description of Activity:

Summary:

Building a Cloud Chamber is a hands-on evidencebased experimental activity embedded in CERN's High School Teacher Programmes. Structured around the IBSE methodology, the ultimate aim of this activity is to raise student interest in the world of particle physics and its applications to fields that influence students' everyday life and well-being. It is designed to enable students to gain inquiry knowledge and skills through observation, collection and interpretation of experimental data, and reflection on experimental outcomes.

Aims:

Building a Cloud Chamber, at a general level, aims to serve as a springboard for exploring different ideas about particle physics based on a multidisciplinary approach. "What is matter made of?", "What does a particle mean?", "How can I visualise particles?", "What types of particle detectors have been developed and currently used by scientists at bigscience laboratories like CERN?", "Are there particle detectors developed for purposes other than basic research?" are some of the questions which this evidence-based activity is aimed to address in a playful, interactive and hands-on fashion towards generating and sustaining student interest in modern physics and science.

Training Material

building_a_cloud_chamber.pdf

Relative Activities

Search for Title

Apply filters

Title: *Asteroid hunters*

Title: *COSMOS*

Title: *The "GeneLab" a gene and biotechnology outreach laboratory*

Title: *Chemistry Networking Science and Technology*

Title: *Quantum Spin-Off: How inquiry can lead to entrepreneurship*

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Monitoring and Impact Assessment

Impact of the Community Building & Support Mechanism

- **10,029 STEM Teachers connected** through the ISE Community Portal;
- **5000 Educational Scenarios created** by Teachers using the ISE Authoring Tool;
- **Implemented in 5,091 Schools** across Europe;

- Average time of the Learning Experience was **01:20 hours;**
- **11,062 students** participated in focused implementations with demonstrators enriched with PSQs.
- **7,757 (or 69.6%) of Students answered all Problem Solving Questions (PSQs)** of a specific Educational Scenario;
- Majority of Teachers believe that the **ISE Solutions** (i.e. IBSE Methodology, e-Learning Tools, Educational Scenarios) **have a high or very high Impact on their Teaching Practices and their Professional Development, on the Motivation of their Students and even on the School Curriculum for Science Education;**
- Very **low Bounce Rates and high number of Returning Visitors further indicate the suitability and acceptance of the ISE portfolio of educational offers.**

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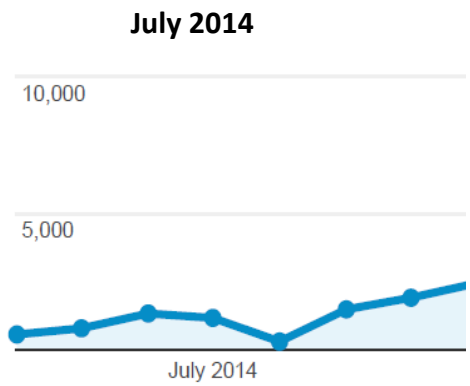
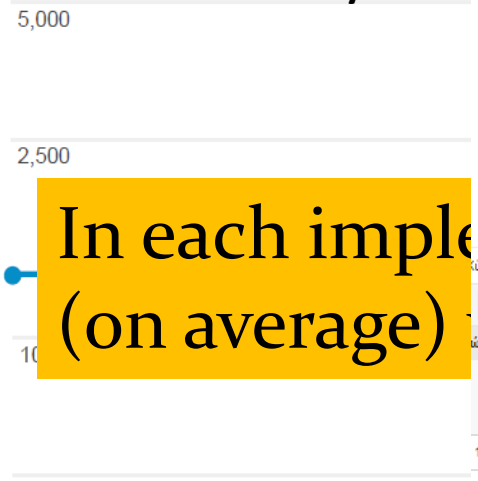
ISE System Components – Sessions 2014 - 2016



ISE Community Porta



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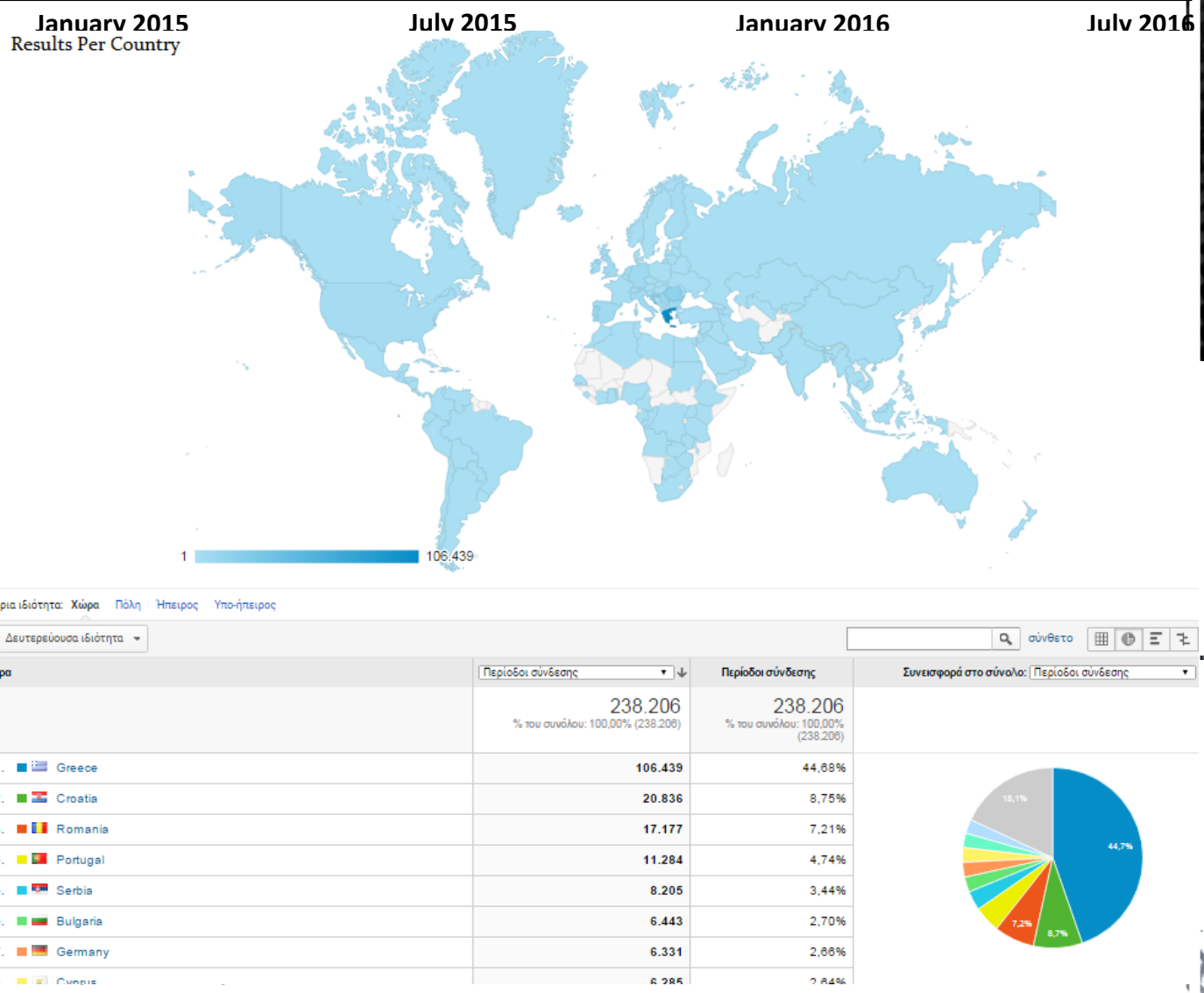

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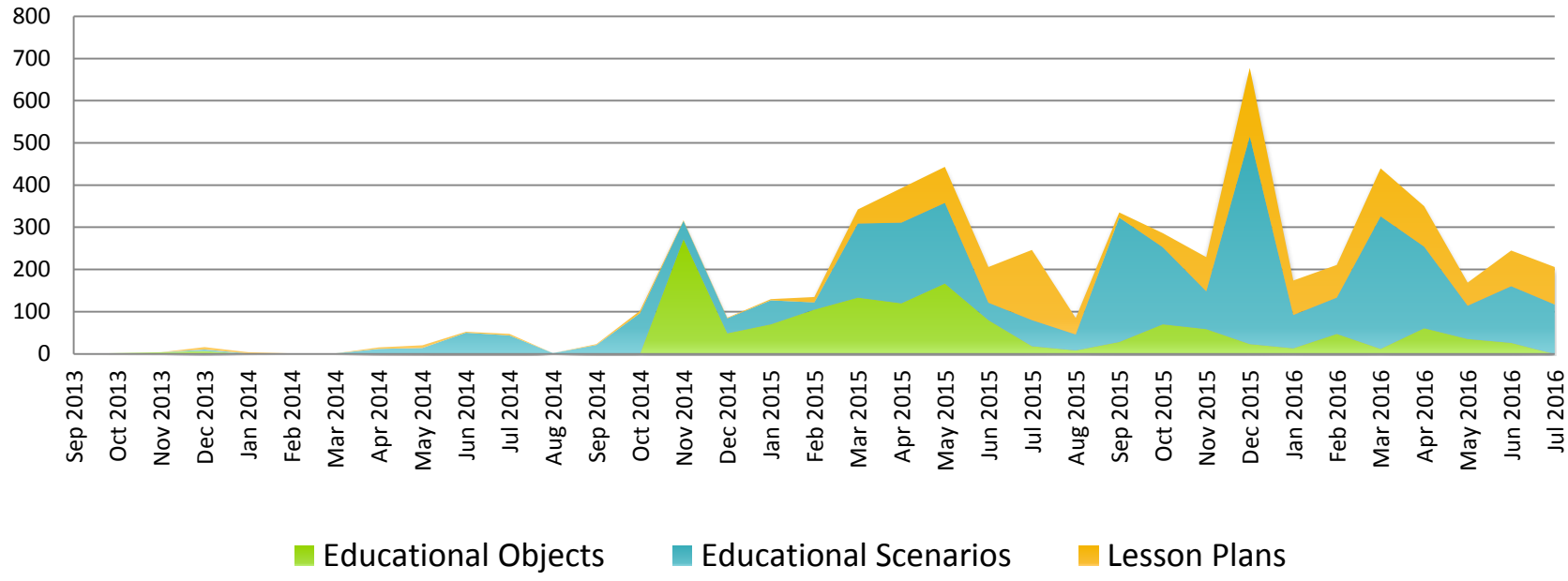
ISE Community Portal - User Generated Content



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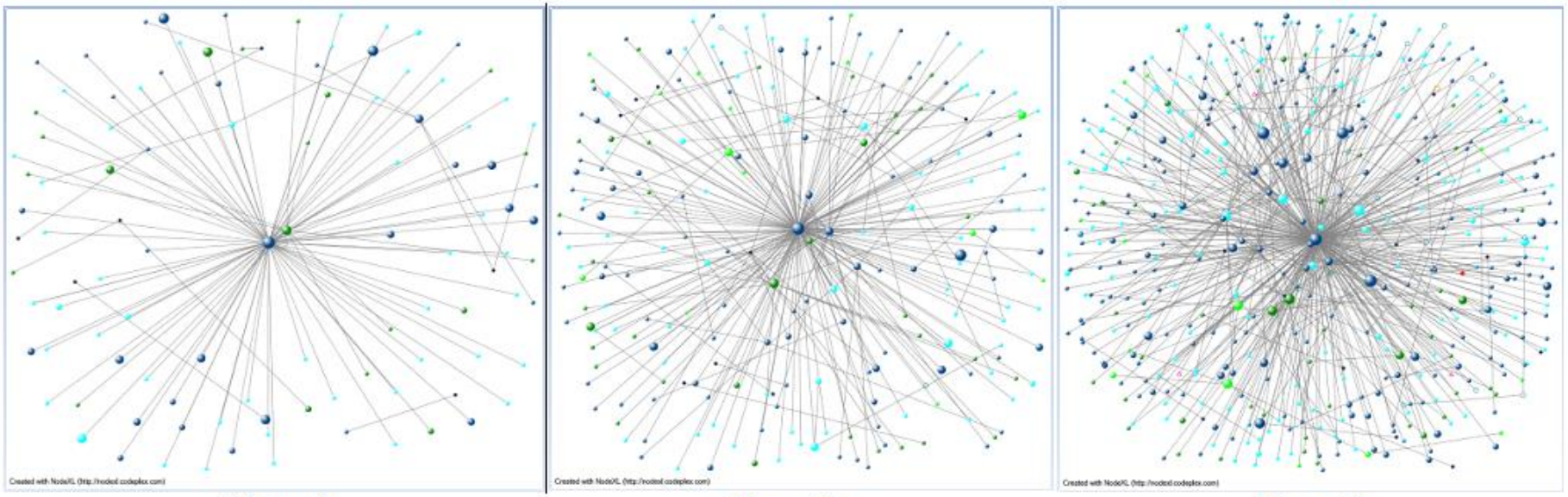
Community Nodes & Connections 2014 - 2016



Year 1 Year 2 Year 3

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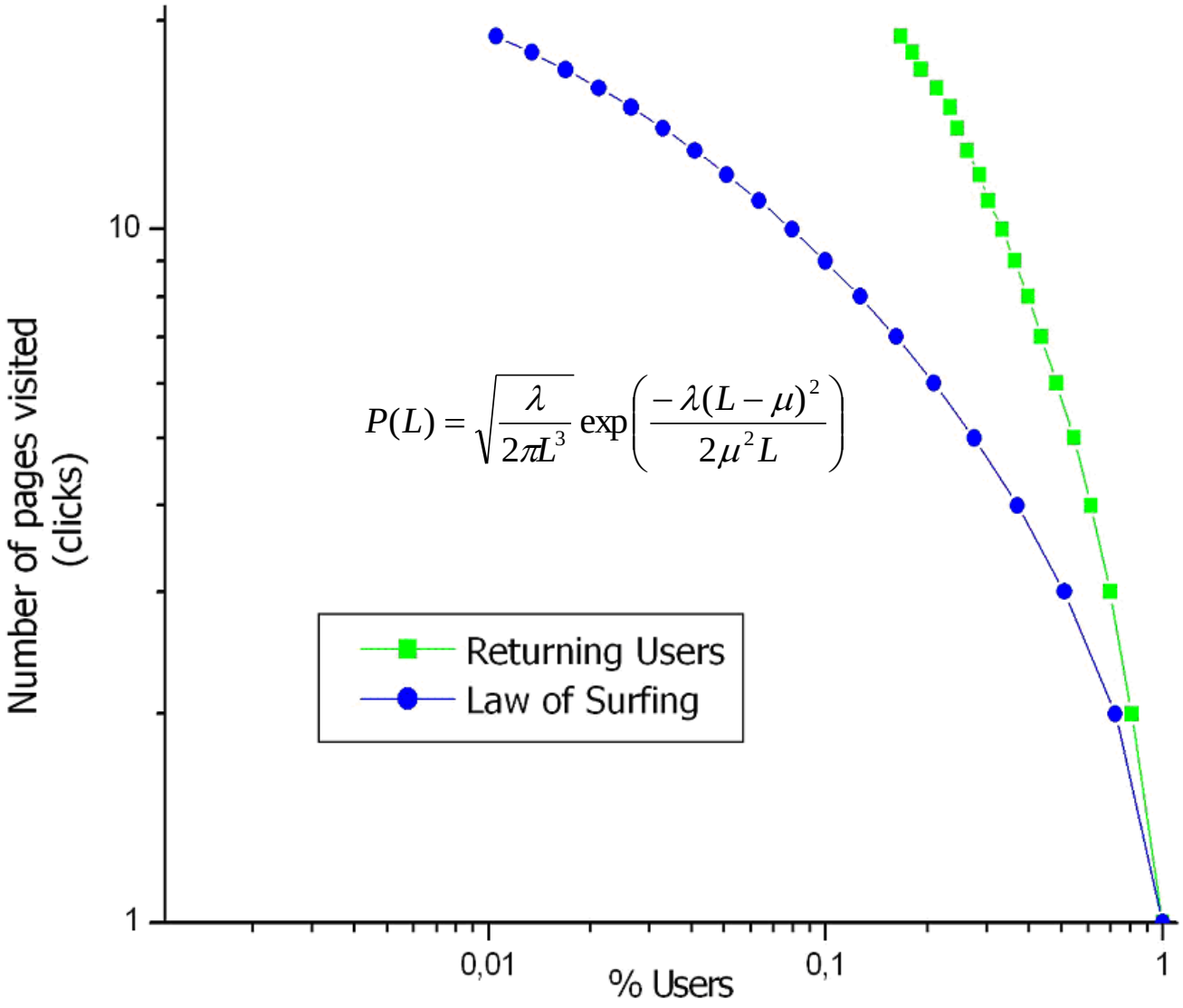

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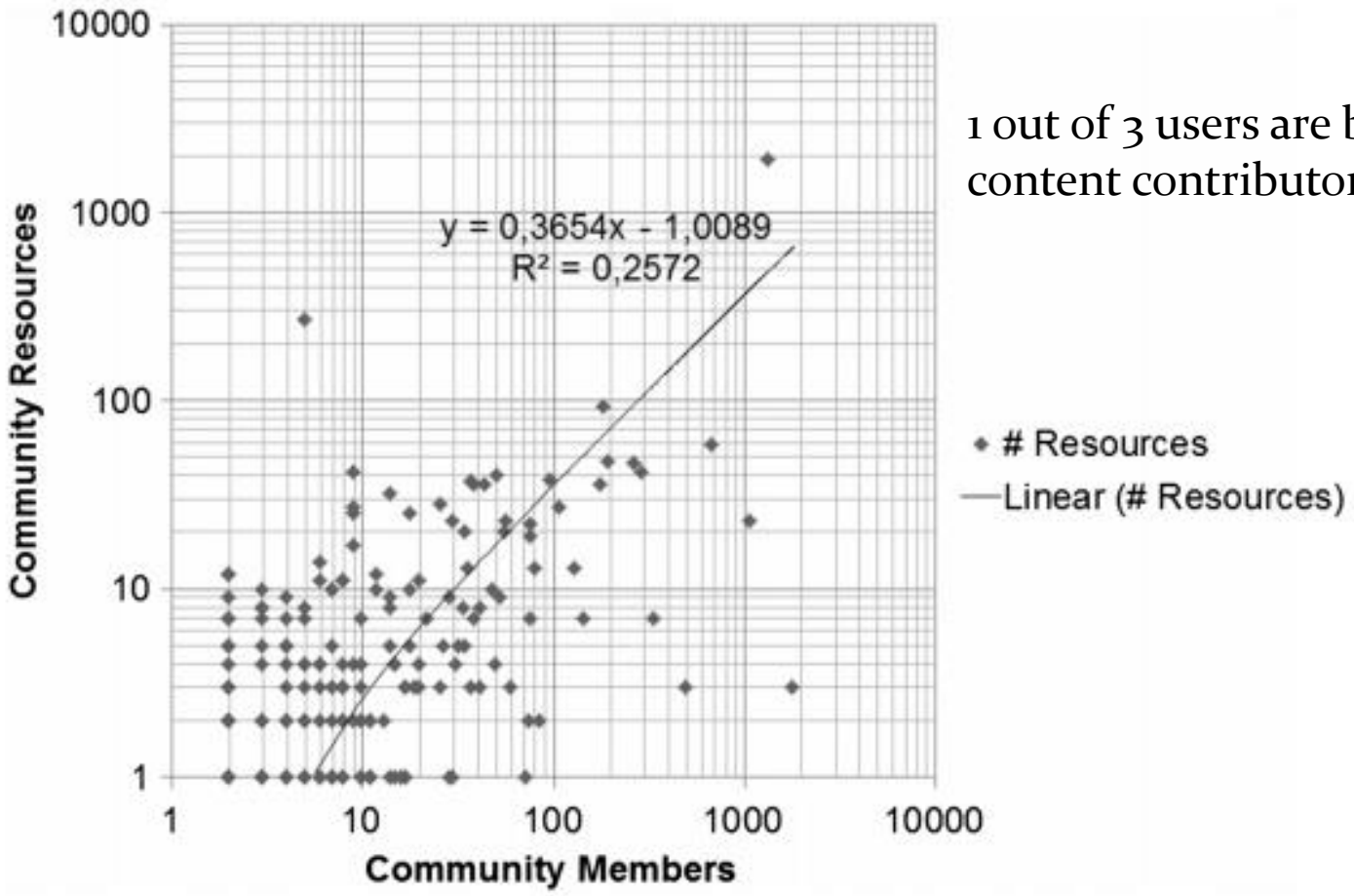
Community Resources vs Number of Members



1 out of 3 users are becoming content contributors

Image Credit:
S. Sotiriou, K. Riviou, S. Cherouvis, E. Chelioti, F. Bogner: "Introducing Large Scale Innovation in Schools"
J Sci Educ Technol (2016) 25:541-549

Conclusions

- Educational Portals can host and effectively facilitate the use of different experiments. Through their services, users can upload and download data, share educational content, search and use e-science applications of their interest.

- Effective search mechanisms allow users to find the resources, lesson plans and e-science applications of their interest efficiently.

- Educational Portals can host a community support environment for exchange of practices and content between users. A high number of Teachers consider the ODS online communities as a sufficient basis to exchange practices and use the portal's tools for sharing Open Educational Resources.

- The Concept of Training Academies for Teacher Professional Development has been thoroughly tested and proven to be successful.
- Portals provide coverage in different languages and provide connection with the social media, thus ensuring their high visibility and outreach potential.
- Portals can provide authoring tools with a solid metadata scheme in order for teachers to create their own IBSE based educational scenarios.
- A solid strategy for portal use validation has been operated and proven to be effective.

THANK YOU!