



Marie Curie Actions

Human resources



and mobility



UniverseNet

Origin of the Universe: Seeking links between fundamental physics & cosmology

Coordinator's report
1 Oct 2006 - 30 Sep 2010

Subir Sarkar



Contract: MRTN-CT-2006-035863

<http://www.physics.ox.ac.uk/universenet/>

39 institutions in 14 European
(+ 1 Korean) national teams



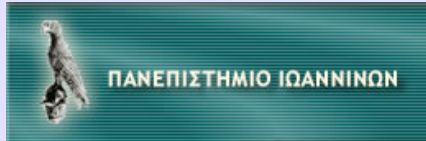
John McDonald



Subir Sarkar



Nick Mavromatos



Kyriakos Tamvakis



John Ellis



Mariano Quiros



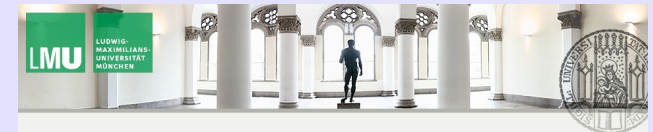
Antonio Masiero



Julien Lesgourgues



Pierre Binetruy



Slava Mukhanov



Kari Enqvist



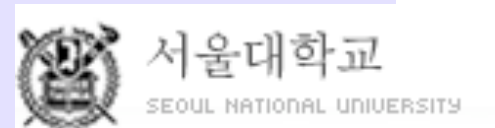
Anupam Mazumdar



Manuel Drees

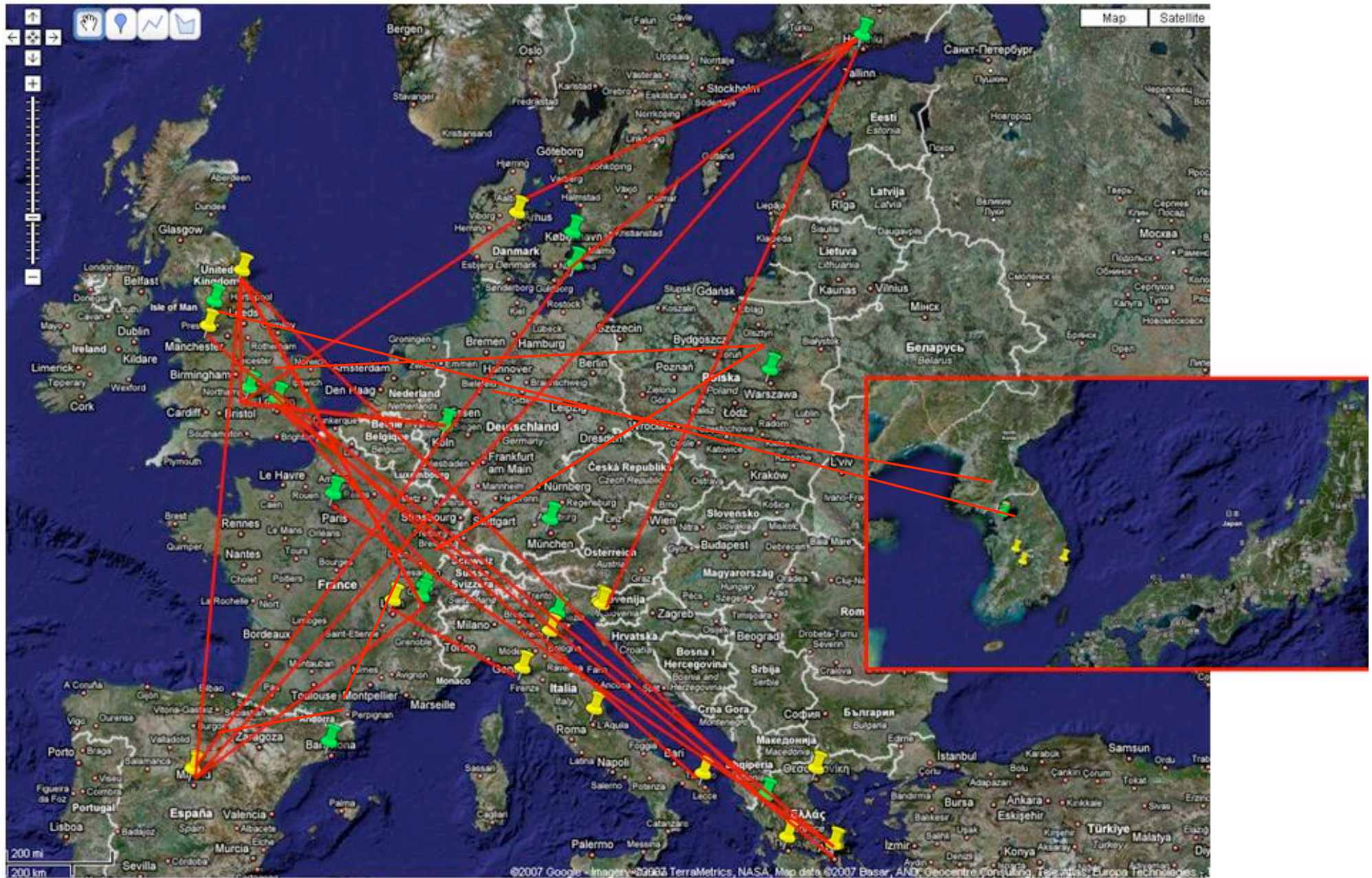


Zygmunt Lalak



Jihn Kim

UniverseNet Partners and collaborations





UniverseNet

**The origin of our universe:
Seeking links between fundamental physics and cosmology**

This network brings together the major European (and Korean) theoretical physics groups investigating the fundamental physics which shaped our Universe. They have made important contributions across the whole spectrum of research in particle cosmology and astroparticle physics, from phenomenological issues concerning the genesis of matter and radiation, dark matter and dark energy, to fundamental questions about the nature of space-time and of the

Big Bang itself. This is an opportune time for such studies, given both the explosion of observational results on the cosmological and astrophysical front, as well as the key tests of theories of new physics beyond the Standard Model which will be performed in forthcoming experiments within the lifetime of the network.

The key research tasks are to investigate:

- 1) the origin of baryons
- 2) the origin of dark matter
- 3) the origin of cosmic radiation
- 4) the origin of cosmic structure
- 5) the origin of dark energy
- 6) the origin of space-time

Mytilene Island of Lesvos, Greece



Fourth Aegean Summer School Black Holes

17 - 22 September 2007

Lecturers

S. Carlip
C. Charmousis
R. Gregory
P. Kanti
H. Kodama
K. Kokkotas
S. Mathur
G. Neugebauer
N. Obers
S. Seahra
G. Siopsis
U. Sperhake

First Annual School of the EU Network "UniverseNet" The Origin of the Universe

24 - 29 September 2007

Lecturers

A. Challinor
E. Copeland
J. Knapp
D. Langlois
J. Peacock
F. Quevedo
S. Pokorski
A. Riotto
A. Strumia
S. Trivedi
P. Ullio

The Aegean Summer School is organized by the Physics Department of the National Technical University of Athens and sponsored by: Physics Department of the University of Tennessee, Ministry of the Aegean, Municipality of Mytilene, Prefecture of Lesvos.

The EU Network School on the Origin of the Universe is organized by "UniverseNet" (MRTN-CT-2006-005863) funded by the European Commission.

Both schools will be held in the Municipal Theatre of Mytilene, courtesy of the Municipality of Mytilene.

Information: <http://www.physics.ntua.gr/cosmo07>
Deadline for applications: 16 July 2007

During 17-22 Sep 2007 we held the first training school with 160 participants (about half were from *outside* the network)

The lectures by leading experts covered both astrophysical and particle cosmology ... there were also research presentations by students & postdocs

FOOTBALL

The second network meeting
University of Oxford, UK



The Origin of the Universe

Seeking links between fundamental physics & cosmology

School: 22, 23, 24, 25 September 2008
Mid-Term Review: 26 September 2008

Venue: Martin Wood lecture theatre
Department of Physics

Lecturers:

- Jenni Adams (Christchurch)
- Lars Bergstorm (Stockholm)
- Wilfried Buchmuller (Hamburg)
- Sergio Colafrancesco (Rome)
- Joe Conlon (Oxford)
- Sacha Davidson (Lyon)
- Amol Dighe (Mumbai)
- Hiranya Peiris (Cambridge)

Coordinator: *Subir Sarkar*
Administrator: *Ana Malhado*

More information:
<http://www.physics.ox.ac.uk/univnet/meeting2008/home.htm>
universenet@physics.ox.ac.uk

UniverseNet is supported by the European Community
(contract n. MRTN-CT-2006-035863)

Marie Curie Actions
Human resources and mobility

During 22-26 Sept
2008 we held the 2nd
training school (with
130 participants
(again half were from
outside the network)

This was followed by
the Mid-term review
conducted by the EC

... we received a
glowing report

The project is excellent and it is so clear that you and all other network partners are putting a lot of efforts to provide excellent results. Also, the training is very good and the fellows have started to have their first results. I would like to remind you to put more efforts on secondments of the fellows and the training on the complementary skills. It is very good that the network is encouraging fellows to play active role in organising some events and to participate at conferences. Furthermore, it is very good that you are inviting recognised scientists in your field to give the lectures to the fellows. It is also highly appreciated that you are attempting to make this scientific field more attractive and understandable to people who are not scientists ...

Dr Lidija Matija (European Commission)

The 3rd school in Barcelona was also popular with 135 participants...



3rd UniverseNet School



Particle Astrophysics and Cosmology

Universitat Autònoma de Barcelona, Bellaterra (Spain)

28 Sept-2 Oct, 2009

<http://universenet.ifee.es/>

Deadline for Applications: 3 August

Marie Curie Actions
Human resources
and mobility



Local Organizers:

Eduard Massó
Mariano Quirós

Scientific Secretariat:

Joan Antoni Cabrer
Oriol Domenech
Javier Serra

Contributed Talks

Convenors:

Thomas Konstandin
Alessio Provenza

Natalia Alonso
(Secretariat)

universenet@ifee.es
Tel. +34 93 581 40 46

... and last, but not least, we have just held a very popular school

UniverseNet - 4th Annual School
Frontiers of Particle Cosmology
Lecce, 13-18 September 2010

University of Salento
Department of Physics
Lecce (Italy)

Programme Committee:
Antonio Masiero
Subir Sarkar

Organising Committee:
Claudio Coriano (Chair)
Roberta Armillis
Antonio Mariano

Lecturers:
Testing dark energy & alternatives (L. Amendola)
The Standard Model & beyond (R. Barbieri)
Inflation & fundamental physics (C. Burgess)
Dark matter: indirect detection (G. Bertone)
Dark matter: direct detection (N. Fornengo)
Standard cosmology & the CMB (A. Jaffe)
Big Bang Nucleosynthesis & new physics (K. Kohri)
Neutrino physics & cosmology (E. Lisi)
The origin of space-time (S.J. Rey)
Statistical methods for cosmology (R. Trotta)

For more information and registration:
<http://www.le.infn.it/univnet10>
univnet10@le.infn.it

There is no registration fee

MARIE CURIE ACTIONS INFN UNIVERSITÀ DEL SALENTO Dipartimento di Fisica

PROVINCIA DI LECCE MONTE DEI PASCHI DI SIENA GRUPPOMPS

Many thanks to the Lecturers and the afternoon speakers, and especially to the local organisers:

Roberta Armillis, Claudio Coriano & Antonio Mariano

UniverseNet also sponsored several other meetings:



UniverseNet members have organised and/or given invited talks at over 200 conferences and workshops for details see: http://www.physics.ox.ac.uk/univnet/universenet_training.htm

What else has the network done?

- **Performed collaborative research** on the key science topics:
>200 inter-team papers published in peer-reviewed journals
- reports to be given by the 'Task coordinators'
- **Appointed 25 Early Stage Researchers** (11 Experienced Researchers & 14 Early Stage Researchers)
- **Organised >200 conferences, schools and workshops**
- **Established links with other networks/ToK activities**
- **Provided expert advice to EU-supported science coordination activities** (ApPEC/ASPERA, Astronet, ...)
- **Outreach activities** (popular talks, articles, YouTube ...)
- ... and most of all we have created strong lasting bonds between many institutions and *especially* between people

Experienced Researchers - ER



Thomas Konstandin

IFAE

from November 2007

Mentor: Christophe Grojean



Eugeny Babichev

Paris VII

from December 2007

Mentor: Krzysztof Meissner



Narandra Sahu

Lancaster

from October 2007

Mentor: Serguey Petcov

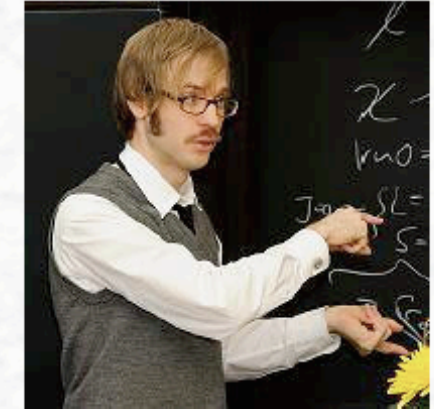


Katarzyna Zuleta

Ioannina

from October 2007

Mentor: Ruth Gregory



Michael Gustafsson

INFN

from October 2008

Mentor: Pierre Ullio



Arman Shafieloo

Oxford

from September 2008

*Mentor:
Leandros Perivolaropoulos*



Juan Bueno Sanchez

Ioannina

from January 2009

Mentor: David Lyth



Eun Kyung Park

Bonn

from October 2007

Mentor: Celine Boehm



Gerasimos Rigopoulos

Helsinki

from October 2007

Mentor: Konstantinos Dimopoulos



Paul Hunt

Warsaw

from October 2007

Mentor: Graham Ross

Early Stage Researchers - ESR



Philipp Mertsch

Oxford University
from October 2007

Mentor: Herbi Dreiner



Anna Kostouki

KCL
from October 2007

Mentor: Smaragda Lola



Wessel Valkenburg

LAPTH-ANNECY
from October 2007

Mentor: Steen Hannestad



Ioannis Ntalianis

Warsaw
from October 2007

Mentor: Anupam Mazudhar



Diana Battefeld

Helsinki
from October 2007

Mentor: Mairi Sakellariadou



Nikolaos Brouzakis

IFAE
from October 2008

Mentor: Nikolaos Tetradis



Andrzej Hryczuk

INFN
from November 2008

Mentor: Marco Cirelli



Vittoria Demozzi

Munich
from December 2008

Mentor: Toni Riotto



Jose Miguel No

CERN
from April 2009

Local Supervisor: Christophe Grojean

Michal Deak
IFAE
From October 2009



**Charalampos
Bogdanos**

ESR at CERN
Nov 2007 to Feb 2008

Local Supervisor:
Ignatius Antoniadis



Nicholas Harries

ESR at CERN
Nov 2007 to Feb 2008

Local Supervisor: John Ellis



Lotta Mether

ESR at CERN
Jan 2008 to April 2008

Local Supervisor: Gian Giudice



Hael Collins

ER at Copenhagen
Oct 2007 to Sept 2008

Mentor: Denis Comelli



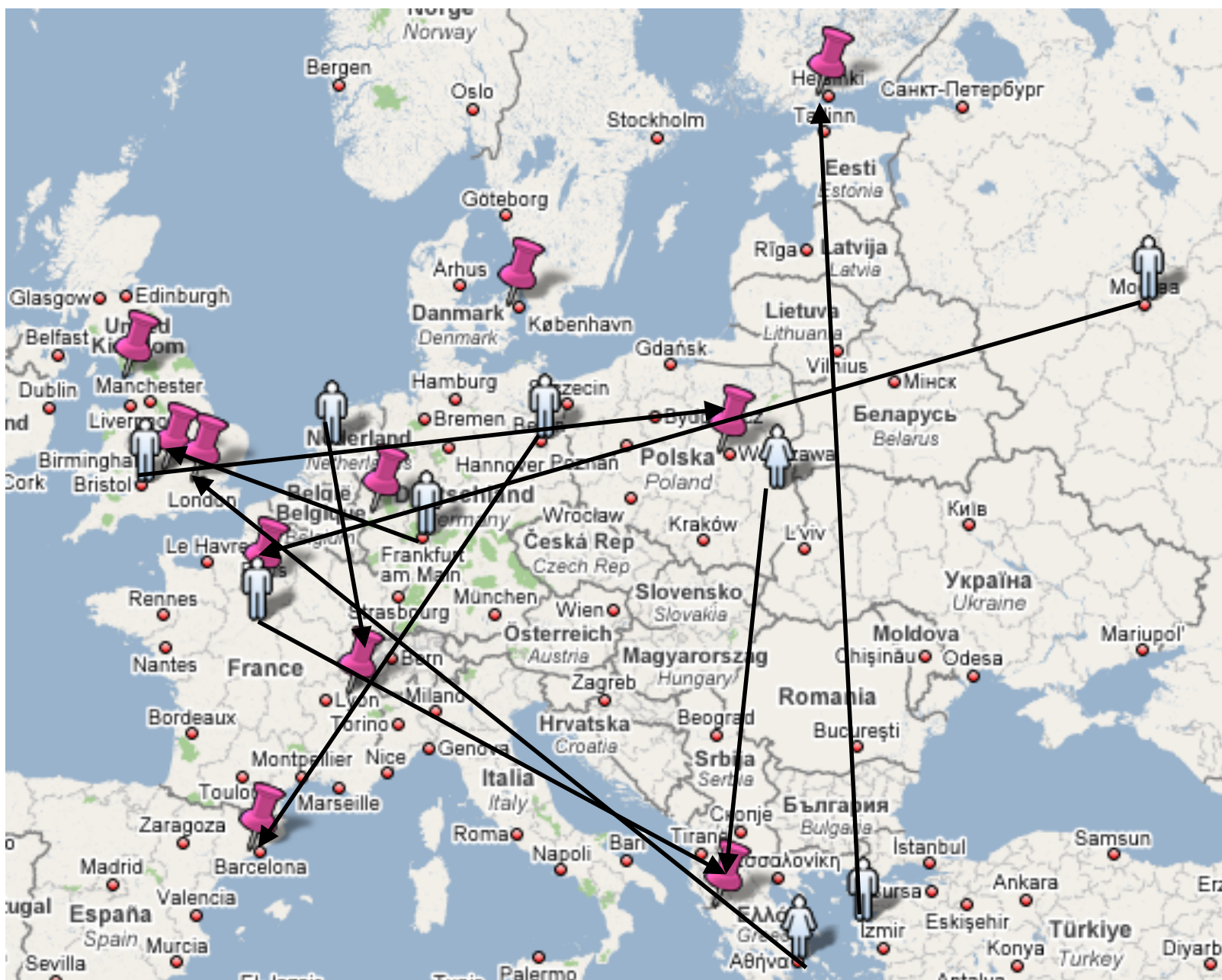
Suchita Kulkarni

ESR at Bonn
Oct 2007 to Mar 2009

Mentor: Sacha Davidson

We bid goodbye to these young researchers,
who are now UniverseNet alumni, and wish
them the very best for their future

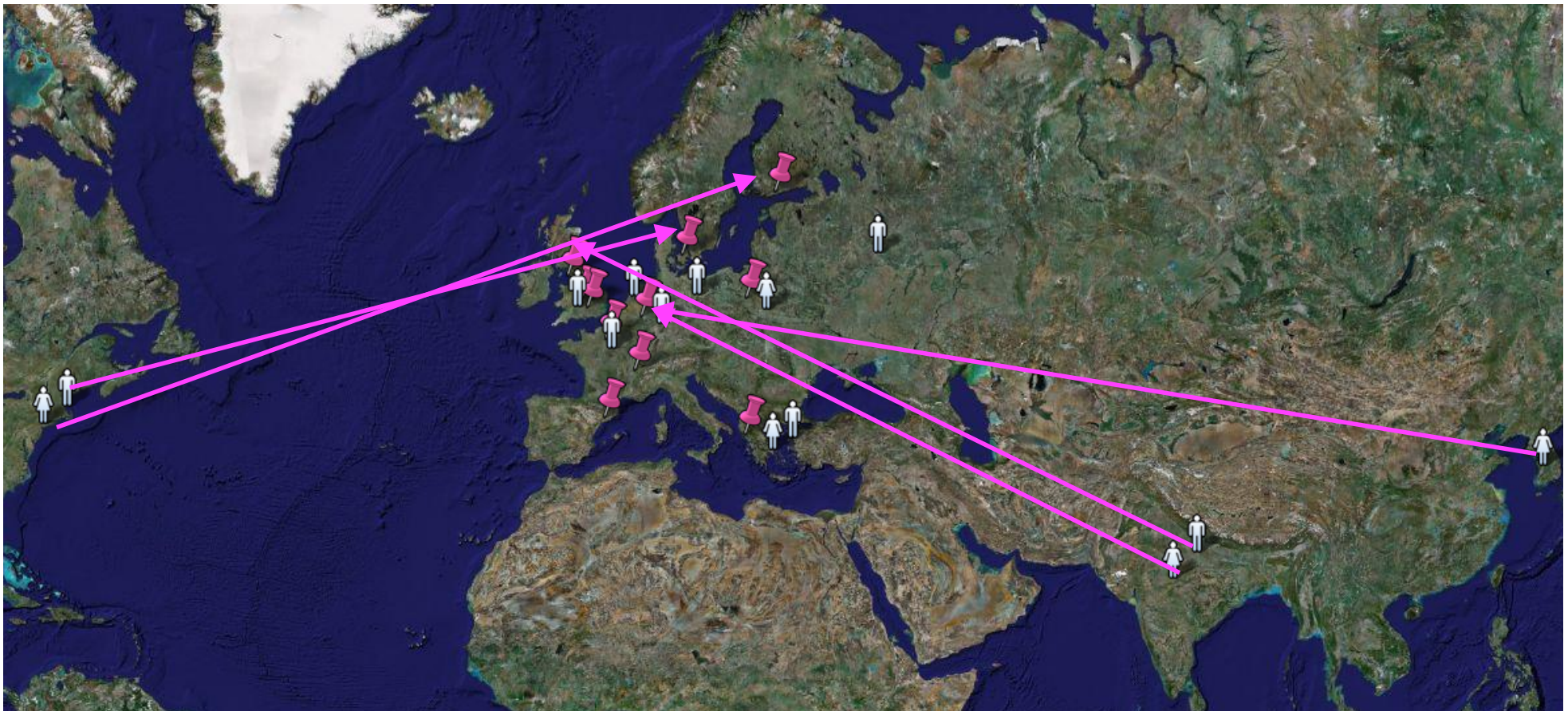
Mobility within Europe



'Addressing gender balance'

About a third of the ESR/ER appointed were women

'Opening the door to third country researchers'



About a third of the ESR/ER appointed were non-EU

Universenet Website

Details of participating teams, young researchers, meetings, publications, outreach ...



● = 100 - 999 ● = 10 - 99 ● = 1 - 9 visits

The above map depicts: 8554 visitors from 6 Apr 2007 to 6 Apr 2010

E-bulletins with the network's news were issued every 6 months ...

European Physical Society awards outreach prize to Prof. Herbert Dreiner and Michael Kortmann, University of Bonn, August 2009



UniverseNet Outreach



Roberto Trotta
 TWELFTH ANNUAL - 2008
MICHELSON
 POSTDOCTORAL PRIZE LECTURER
 Department of Physics, Case Western Reserve University

Dr. Roberto Trotta is currently a postdoctoral fellow at Oxford University, UK. He received his PhD in physics at the University of Genova in 2004. His research is focused on the application of advanced statistical methods to the problems of cosmology. Dr. Trotta is an exceptionally active communicator of science to the public.

- Monday May 5, 12:00 pm, Miller Room, Rockefeller 221 Seminar 1
 Bayes in the sky - Advanced statistical tools for cosmology
- Tuesday May 6, 11:30 am, Miller Room, Rockefeller 221 Seminar 2
 Probing dark energy with cosmology
- Wednesday May 7, 4:15 pm, Rockefeller 301 Colloquium
 Precision cosmology for the 21st century
- Friday May 9, 12:00 pm, Miller Room, Rockefeller 221 Seminar 3
 Astrophysical probes of dark matter

CASE WESTERN RESERVE UNIVERSITY

physicsworld.com

Home News Blog Multimedia In depth Jobs

- Recent entries
- Atlantic oscillation makes global warming a tougher sell
 - More physics on the silver screen...
 - Laser...the film
 - Too hot to handle
 - Bryson craves more physics knowledge
 - Dark matters in a salt mine
 - Visiting the quietest building in the world
 - Shining a light on the usefulness of physics
 - And the survey says...
 - How to define a kilogram
- Monthly archives

Blog
 Asking the big questions in London



Trivial matters: Subir Sarkar sets up for his dark energy demolition job

YouTube - Ship floating on nothing! :: Physikshow Uni Bonn

http://in.youtube.com/watch?v=1PJTq2xQJQ0&feature=... Google

YouTube Broadcast Yourself™ Home Videos Channels Community

Ship floating on nothing! :: Physikshow Uni Bonn

From: TheVelvetMonkey
 Added: January 06, 2007
 Get enchanted by a aluminium foil ship floating above...

URL: http://in.youtube.com/watch?v=1PJTq2xQJQ0

Embed: <object width="425" height="344"><param name="...>

More From: TheVelvetMonkey

Related Videos

- Liquid Nitrogen Bomb :: Physikshow Uni Bonn
 00:27 From: TheVelvetMonkey
 Views: 126,061
- Ship launching
 04:05 From: Fidelio0690
 Views: 144,012
- Voice change with sulphur hexafluoride :: Physikshow Uni Bonn
 00:21 From: TheVelvetMonkey
 Views: 26,193
- Lego Machine Gun
 02:43 From: BillyGlenn
 Views: 685,698
- Real Ball Lightning Created in the Lab
 00:27 From: Itvler1998

Promoted Videos

Rate: ★★★★★ 681 ratings Views: 883,948

Share Favorite Playlists Flag

Send Video orkut MySpace more share options

Commentary Statistics & Data

Video Responses: 0 Text Comments: 288

Video Responses (0) Post a Video Response

Text Comments (288) Post a Text Comment

Waiting for video-stats.video.google.com...

We are well placed to engage with the ambitious plans being made in Europe concerning astroparticle physics



F. Avignone, J. Bernabeu, P. Binetruy, H. Blümer, K. Danzmann,
F.v. Feilitzsch, E. Fernandez, J. Iliopoulos, U. Katz, P. Lipari,
M. Martinez, A. Masiero, B. Mours, F. Ronga, A. Rubbia, S. Sarkar,
G. Sigl, G. Smadja, N. Smith, C. Spiering (Chair), A. Watson

Key questions:

What is the universe made of?

Do protons last for ever?

What are the properties of neutrinos ... and their role in cosmic evolution?

What can neutrinos tell us about the interior of the Sun and Earth, and about
supernova explosions?

What is the origin of cosmic rays? How does the sky look at extreme energies?

What is the nature of gravity? Can we detect gravitational waves? What can
they tell us about violent cosmic processes?

10. Coordination of astroparticle theory

From the ASPERA roadmap

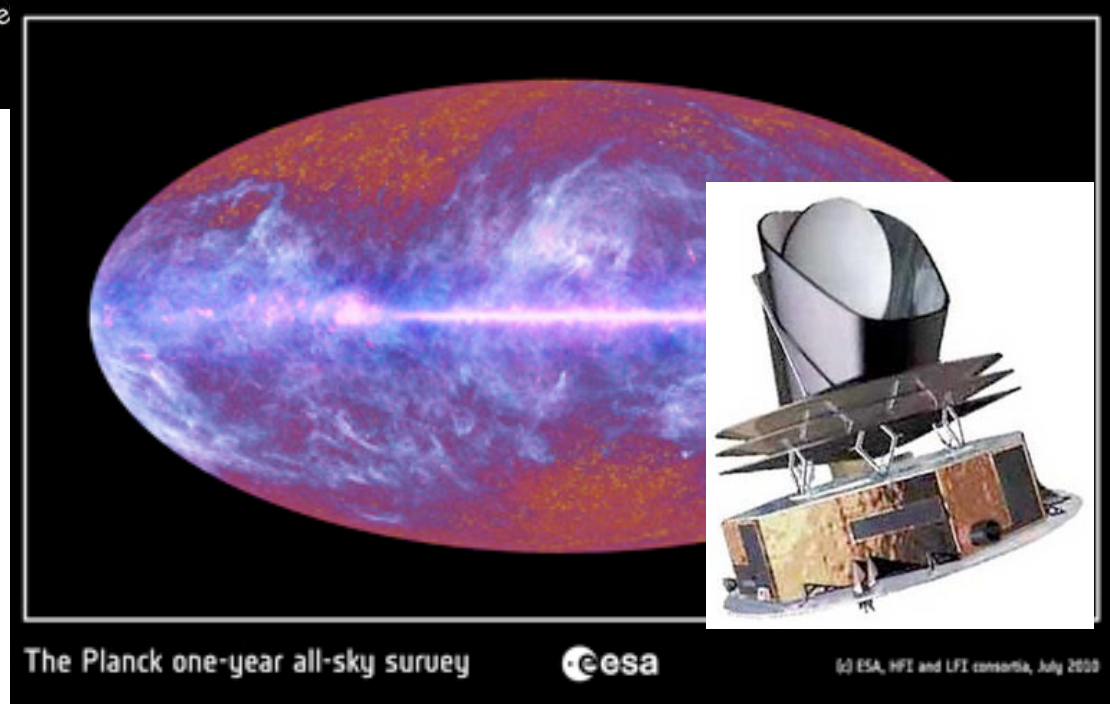
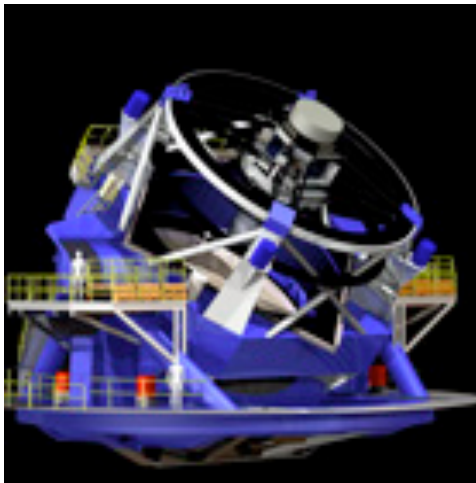
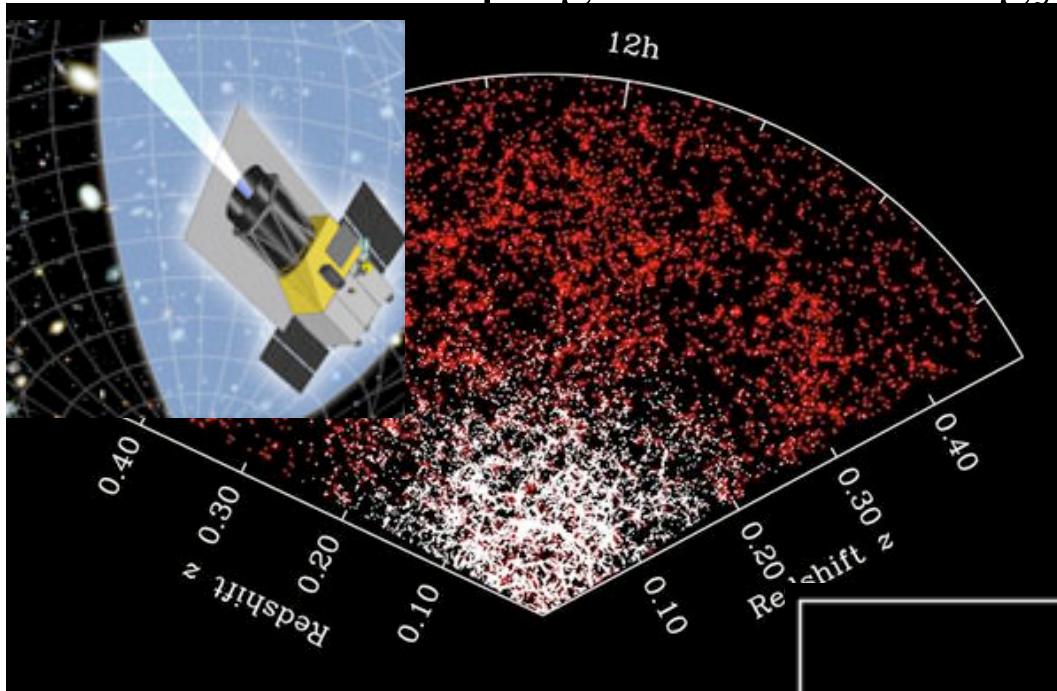
Theoretical research is an invaluable source of new concepts, of inspiration for experimenters and a necessary tool to interpret experimental results. Theorists are spearheads in combining particle physics, cosmology and astrophysics. Like experiment, theory needs reliable support and coordination.

Theory is an invaluable source of inspiration for experimenters and a necessary tool to interpret experimental results, and must be supported with the same recognition like experiments. Among the discussed proposals for improved support and coordination of astroparticle theory we mention a Europe-wide common call for theoretical proposals and a future European Centre for Astroparticle Theory, with the involvement of an international panel of expert referees. Such a centre could be established either in one of the European countries or at CERN. Given the synergy between LHC physics and astroparticle physics, CERN would be a natural host, especially in view of several astroparticle experiments being CERN ‘recognised experiments’.

The arrangements for PACT at CERN are currently being finalized



We work also on topics relevant to new astronomical campaigns on dark energy



Summary

- UniverseNet is over ... but we have paved the way for coordination of theoretical research in particle astrophysics and cosmology in Europe
- Our annual schools are very popular and we hope to find some way to continue holding them (possibly with EU support)
- The training programme has generated some of the leading young researchers in Europe in this field ... we will reapply for a FP7 'Initial Training Network' in order that we can continue doing this (with the necessary 'industrial involvement' where appropriate)
- With the expansion of the network (and the interest shown by many new groups) it may be appropriate for us to evolve into a supporting instrument through ASPERA for large European astroparticle and cosmology research infrastructures ... this possibility will be explored