

# UniverseNet project - Bulletin

Marie Curie Actions  
Human resources and mobility



## April 07

### News

UniverseNet completed **6 months** on 1<sup>st</sup> April 2007 and lots of things have happened already. We have appointed **4 early stage researchers (ESRs) and 8 experienced researchers (ERs)**. Two have started in Nov. 2006 and the others will start in Oct. 2007.

*A new collaboration between Helsinki and Lancaster has been established* to study recent developments in SUSY cosmology. Regular UniverseNet-funded exchange visits by PhD students are a key feature of the research plan.

### ESR- ER information

Do you already know the appointed ESRs and the ERs?

Oxford - ESR **Phillipp Mertsch**

Lancaster – ER **Narendra Sahu**

London- ESR **Anna Kostouki**

Barcelona- ER **Thomas Konstandin**

Bonn – ESR **Suchita Kulkarni**

Bonn – ER **Eun Kyung Park**

Helsinki – ER **Gerasimos Rigopoulos**

Ioannina - ER **Nicolas Chatillon**

Ioannina – ER **Katarzyna Zuleta**

Paris – ER **Eugeny Babichev**

Annecy - ESR **Wessel Valkenburg**

Warsaw - ER **Paul Hunt**



Suchita Kulkarni

**Learn a bit about our ESR Suchita Kulkarni (suchita.kulkarni@gmail.com).** I stay in a small town near Mumbai. Until my high school astronomy was my hobby. However, due to a methodical introduction to astronomy from my high school teacher I decided to take it up as a career.

I found myself exploring different areas of this branch while completing the regular coursework. However, cosmology always sat on top amongst all other.

Another very important turn came when I completed coursework in particle physics during master degree. I realized this seemingly tiny world has profound effects on astronomical scales. A further interesting situation arose when I read about dark matter and dark energy. The idea of exploring interconnections between the two became a subject of immense interest.

For my PhD I wish to work on the boundary of these two areas. Aiming to build a theory perfectly in harmony with cosmological observations and high energy physics experiments, I wish to wonder in the dark world of cosmology with the light of particle physics knowledge.

Well, this does not mean I have been just studying all my life. Traveling, photography, trekking and teaching are a few of my hobbies.

If you don't find me in my study and I am in town then there is a hundred percent chance that I have gone to take an Olympiad lecture in my high school or am wandering in outskirts of city clicking my Nikon Coolpix.

### “ESR – space”

**Learn a bit about our ESR Wessel Valkenburg (valkenbu@lapp.in2p3.fr).** After finishing my masters at the University of Utrecht, the Netherlands, under supervision of Dr. Tomislav Prokopec, it was time to decide what to do with my achieved academical status: do commercial business or try to add something to the wisdom of mankind. Stated like this it was not a hard choice. Until then I had lived the life I wanted to, full of sports, music and friends. Though, it was all in the tiny world of the Netherlands. Given these circumstances I decided to try to obtain a PhD-position somewhere abroad, and I was pleased to hear about an available position in the UniverseNet, at the Laboratoire d'Annecy-Le-Vieux de Physique Théorique under supervision of Dr. Julien Lesgourgues. After applying and competing, I was even more glad to find out that I could actually start as a PhD-student in Annecy, France.



Wessel Valkenburg

This is a first step in hopefully a joyful stay in physics! My research will be about theoretical models vs. experimental constraints. A first work has already been posted on the archives, and I plan to continue attributing

**Learn a bit about our ER Narendra Sahu (narendra@prl.res.in).**

In the last six and half years I have been working in astro-particle physics. In particular, I am interested in “leptogenesis” which is an explanation for matter (4 percent) antimatter (0 percent) asymmetry of the present Universe. I am also interested in particle physics models of dark matter (23 percent) and dark energy (73 percent) which constitutes the major components of the total energy budget of the Universe. Apart from physics, I am also interested in watching nature and playing football...



**Learn a bit about our ER Eugeny Babichev (eugeny.babichev@lngs.infn.it).**

I was born in Cherepovetz, Russia in 1976. In 1994, after finishing high school, I became a student at the Moscow Institute of Physics and Technology (MIPT). I carried out my diploma research on "The isometric embedding of black hole horizons into Euclidean space".



In 2003, I defended my Ph.D. thesis "Gravitational and electromagnetic radiation from chiral cosmic strings", carried out in MIPT and LPI under the supervision of Dr. V.Dokuchaev. Then I started my work at the Institute for Nuclear Research of the Russian Academy of Sciences (2003-2004) and in September 2004 I moved to the Max-Planck-Institute for Physics in Munich. At the end of 2006 I moved to the Laboratory Nazionale del Gran Sasso, INFN, Italy to work as a postdoctoral fellow.

My research has been mainly focused on two distinct areas of physics: i) cosmology and black hole physics; ii) different aspects of the theory of cosmic strings.

I have been involved in studies of cosmology with a fluid dark energy as well as in model building of inflation with non-standard kinetic terms. In the projects that I have been involved in, we also studied the behaviour of different types of matter and non-canonical scalar fields in the neighbourhood of a black hole. I plan to continue the research on non-canonical scalar fields in strong gravitation fields, and to study quantum properties of scalar perturbations.

Cosmic strings theory is the other area of interest for me. My previous investigations include different aspects of gravitational, electromagnetic and dilaton radiation from cosmic strings. In my future work I plan to continue studying cosmic strings and cosmic superstrings, and to constrain the allowed parameters of cosmic strings and underlying theories. I am also interested in scalar fields with non-standard kinetic terms in the application to topological defects.

Eugeny Babichev



Thomas Konstandin

**Learn a bit about our ER Thomas Konstandin (konstand@kth.se).**

Currently, I am working as a postdoc in theoretical physics at the Kungliga Tekniska Högskolan, situated in the beautiful city of Stockholm. This fall (2007), I will move to Barcelona to become a postdoc at the Institut de Física d'Altes Energies; yet another interesting position in an exciting city.

I received my Master's degree at UMass in Amherst, Massachusetts, in 2001 where I was involved in research about effective approaches to quantum gravity with Prof. Donoghue and Prof. Holstein. Afterwards, I was accepted for a PhD position at the University in Heidelberg where I was mostly studying electroweak baryogenesis and quantum transport mechanisms in the group of Prof. Schmidt.

Since I received my PhD degree in 2005, I am interested in various topics of cosmology and astroparticle physics: Leptogenesis, neutrinos in cosmology, production of gravitational waves by first order phase transitions, inflation, electroweak baryogenesis, SUSY phenomenology.

Besides common spare time distractions (reading / cinema / travelling), I enjoy playing Volleyball in a club. Recently, I became interested in the Asian board game Igo and picked up the Scandinavian habit of playing Poker with friends.

## Universenet website

**Find time to visit our website and send us suggestions, corrections, ideas!!**

*We have recently updated the website with (hopefully!) useful information:*

*Publications,  
ESR-ER researchers,  
Events,  
Outreach,  
And others...*

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

## Universenet logo Competition!

Are you creative?

Would you like to have a break from your work?

Enter the Universenet competition:

**“Create a logo  
for our Universenet Project”!!!**

*Prize:* a dinner in Greece

*How to enter:* send your logo idea to  
[universenet@physics.ox.ac.uk](mailto:universenet@physics.ox.ac.uk)

*Deadline:* May, 31<sup>st</sup> 2007.

## “Universenet in Numbers”

Partners	<b>14</b>
Members	<b>235</b>
Institutions	<b>39</b>
ESR appointed/ total	<b>4/ 10</b>
ER appointed/ total	<b>8/11</b>
Publications	<b>22</b>
Month in the project/ total	<b>7/48</b>

## Universenet Publications

**Please let us know about your PUBLICATIONS!!!!**

**And do remember to acknowledge the network when appropriated:** "This work was supported (or partially supported) by the EU FP6 Marie Curie Research & Training Network "UniverseNet" (MRTN-CT-2006-035863)".

**Inter-team publications** are very important to our network!!!

If there is anything you would like posted in future Bulletins, please contact

*Ana Malhado* [universenet@physics.ox.ac.uk](mailto:universenet@physics.ox.ac.uk)

## Universenet School

The webpage for our first annual school/meeting (24-29 September) in Mytilene, Greece is now ready:

<http://www.physics.ntua.gr/cosmo07/UniNet/>

Please register as soon as possible and bring this to the attention of others - non-network people are welcome to attend and we are not charging any registration fee.

The School aims to provide training for postgraduate students and postdoctoral researchers in the exciting interdisciplinary field of particle astrophysics/cosmology.

The audience is expected to be quite diverse, including both particle physicists and astrophysicists, and the emphasis will be on theory although observations and experiments will be covered.

### Lecture programme:

**\*\*Anthony Challinor** (Cambridge)

*"Cosmic microwave background: generation & observations of anisotropies"*

**\*\*Ed Copeland** (Nottingham)

*"Dark energy: the evidence & possible physical explanations"*

**\*\*Johannes Knapp** (Leeds)

*"The high energy universe: cosmic rays, gamma-rays & neutrinos"*

**\*\*David Langlois** (Paris)

*"Brane-world: gravity & cosmological evolution"*

**\*\*John Peacock** (Edinburgh)

*"Large-scale structure: from primordial perturbations to galaxies"*

**\*\*Stefan Pokorski** (Warsaw)

*"The SM and beyond: successes & failures of field theory"*

**\*\*Fernando Quevedo** (Cambridge)

*"Beyond inflation: string theory & the initial singularity"*

**\*\*Tony Riotto** (Padova)

*"Inflation: the generation of perturbations in scalar field models"*

**\*\*Alessandro Strumia** (Pisa)

*"Neutrino physics: phenomenology & cosmology"*

**\*\*Sandip Trivedi** (Mumbai)

*"String theory and the landscape: what cosmologists need to know"*

**\*\*Piero Ullio** (Trieste)

*"Dark matter: particle candidates & their detection"*