February 2010

UniverseNet Bulletin

News

•A big thank you to everyone for the work put into the 2009 Annual Report. Our Scientific Officer was very pleased with the Network's progress and has written: "*I am very satisfied with the progress made during the 3rd year. The scientific output and the level of networking are impressive. The Fellows are receiving high-quality training in their scientific discipline. In addition to that, I very much appreciate your activities in educating the general public on your research that is on the forefront of fundamental physics*."

•A new application for an 'Initial Training Network' under the EU's FP7 framework has been submitted (with some additional nodes) so we can build on the achievements of the Network so far. We will update everyone when we receive feedback from the EU.

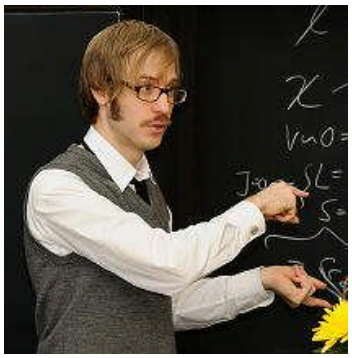
•The third annual Network School took place at Universitat Autònoma de Barcelona, Bellaterra, Spain from 28th September to 3rd October 2009. As usual there were pedagogical lectures in the mornings and short presentations by the participants in the afternoons. On the final day the annual meeting of the network was held. The Network Coordinator reported on the year's activities, followed by scientific reports from the Task Coordinators. Young researchers who joined the network in the past year also made brief presentations. A big thank you to the local organisers Eduard Massó and Mariano Quirós, assisted by the Scientific Secretariat (Joan Antoni Cabrer, Marc Montull, Marc Ramon and Javier Serra) and the Contributed Talks Covenors (Thomas Konstandin and Alesio Provenza) and of course the Secretariat (Natalia Alonso). A thoroughly enjoyable time was had by all, both in and out of the lecture hall. For more information and to download the presentations go to: http://universenet.ifae.es/

•The fourth and final Network School and meeting will take place in Lecce, Italy from 13-18 September 2010. We expect network participants to arrive on Sunday 12 September and leave on Saturday 18 September in the *afternoon* (after the annual network meeting to be held that morning). Non-network people are welcome to attend the school (and the meeting should they wish to). The organising committee is chaired by Antonio Masiero (as the host country Scientist-in-Charge) and includes Claudio Coriano (who heads the Local Organising Committee) and Subir Sarkar (ex-officio). Claudio has already booked a suitable venue (http://www.officinecantelmo.it/) and block-booked rooms in a nearby hotel (http://www.grandhoteltiziano.it/) where the shuttle bus from Brindisi airport stops. We are sure that everything will be well organised and we will have a great time both scientifically and otherwise. This is the last meeting of the present network but may well turn out to be the start of something new so we would urge you all to attend.

•Welcome to Michal Deak a new ESR who started with IFAE in September 2009.

ER-ESR Information

ER – Michael Gustafsson (INFN)



I finished my PhD in Stockholm under the supervision of Lars Bergström 2008, and am currently a postdoc at the INFN (the National Institute for Nuclear Physics) in the Department of Physics ‘Galileo Galilei’ in the historical city of Padova.

My research interest is to probe beyond standard model theories, predict their observable effects, and confront them with cosmological, astronomical and experimental data. I have mostly worked on dark matter related phenomenology. If the dark matter consist of weakly interacting massive particles (WIMPs) they could self interact, annihilate, and produce detectable signals in the form of high energetic ordinary standard model particles. To find out characteristic detectable signatures expected from such annihilations has been one of my main research areas – especially to predict clear gamma-ray signals. Examples of frameworks within which I have worked are minimal supersymmetry, extra-dimensional models predicting dark matter in the form of Kaluza-Klein states and different minimal extension of the standard model such as the inert 'higgs' doublet model. Another subject of research has been simulation studies to try to better understand the dark matter distribution within galaxies such as the Milky Way. Existing and upcoming observational and experimental data has the potential to give much more information on the nature of the dark matter. If these can guide us to an effective particle model for the dark matter, a more fundamental theory, or even completely change our view of the Universe is a research field I want to keep working in.

Apart from physics, I hope to experience as much as possible of cultural activities (theater, art, books, music, club life), good food and wine together with friends, sport activities (climbing, running, squash, windsurfing), and at last, but not the least, I hope to see many excellent old and new movies.

ESR – Vittoria Demozzi (Munich)

I am a Ph. D. student at the Ludwid-Maximilians-Universitaet (Munich, Germany) under the supervision of Prof. Viatcheslav Mukhanov. I have obtained my bachelor and master degrees at the University of Trento (Italy) under the supervision of Prof. Luciano Vanzo, the subject of my master thesis was the calculation of the post-Newtonian parameter in $f(R)$ theories of gravity.

My research interests concern inflation and large-scale magnetic fields. Astronomical observations suggest that planets, galaxies, clusters of galaxies and the intergalactic medium carry magnetic fields. Their origin is unknown and many scenarios have been proposed to explain them. I am interested in the possibility of producing such fields in the Early Universe. In a recent work we have considered the generation of large-scale magnetic fields during inflation in a broad class of models where the conformal invariance is broken and thus inflation can strongly amplify quantum vacuum fluctuations. However, taking into account the back reaction of the electromagnetic field on the background and requiring that inflation lasts at least 75 e-folds, we have found that the strength of the field is much smaller than the observed one and it is not clear whether such a tiny field can work as a seed for a possible dynamo mechanism. My interests are also on cosmological perturbation theory, dark energy and CMBR.

Apart from physics I like playing the piano and singing in a church choir. I enjoy meeting friends in the nice cafes of Munich and going to the cinema. I like hiking and I have recently started to climb.

ER-ESR Overview

Partner	Researcher	Mentor	Nationality	ESR		ER	
				target months	months to end of Feb 2010	target months	months to end of Feb 2010
Oxford	Phillipp Mertsch	Herbi Dreiner	German (MS)	36	29		
Oxford	Arman Shafieloo	Leandros Perivolaropoulos	Iran (3rd country)			24	17.5
Lancaster	Narendra Sahu	Serguey Petcov	Indian (3rd country)			24	24
KCL	Anna Kostouki	Smaragda Lola	Greek (MS)	36	36		
IFAE	Nikolaos Brouzakis	Nikolaos Tetradis	Greek (MS)	24	17		
IFAE	Michal Deak	Subir Sarkar	Slovakia (MS)	12	5		
IFAE	Thomas Konstandin	Christophe Grojean	German (MS)			24	24
Bonn	Suchita Kulkarni	Sacha Davidson	Indian (3rd country)	18	18		
Bonn	Eun Kyung Park	Celine Boehm	Korean (3rd country)			24	24
Munchen	Vittoria Demozzi		Italian (MS)	18	15		
CERN	Charalampos Bogdanos	Ignatius Antoniadis	Greek (MS)	4	4		
CERN	Nicholas Harries	John Ellis	UK (MS)	4	4		
CERN	Lotta Mether	Gian Giudice	Finnish (MS)	4	4		
CERN	Jose Miguel No	Christophe Grojean	Spanish (MS)	6	2		
CERN	*Daniel Figueroa*			4	0		
CERN	*Paolo Panci*			2	0		
Helsinki	Diana Battefeld	Mairi Sakellariadou	US (3rd country)	24	24		
Helsinki	Gerasimos Rigopoulos	Konstantinos Dimopoulos	Greek (MS)			24	24
Ioannina	Nicolas Chatillon	David Langlois	French (MS)			9	9
Ioannina	Juan Bueno Sanchez	David Lyth	Spanish (MS)			15	14
Ioannina	Katarzyna Zuleta	Ruth Gregory	Polish (MS)			24	24
INFN	Andrzej Hryczuk	Marco Cirelli	Polish (MS)	22.5	15.5		
INFN	*(to be recruited)*			6.5	0		
INFN	*(to be recruited)*			7	0		
INFN	Michael Gustafsson	Pierre Ullio	Sweden (MS)			24	16
Paris VII	Eugeny Babichev	Krzysztof Meissner	Russian (3rd country)			24	24
Annecy	Wessel Valkenburg	Steen Hannestad	The Netherlands (MS)	36	36		
Warsaw	Paul Hunt	Graham Ross	UK (MS)			24	24
Warsaw	Ioannis Ntalianis	Anupam Mazudar	Greek (MS)	36	29		
Copenhagen	Hael Collins	Denis Comelli	US (3rd country)			12	12
			TOTALS (months)	**300**	**238.5**	**252**	**236.5**

Universenet in Numbers

Partners	**15**
Members	**273**
Institutions	**39**
ESR appointed/ total	**13/ 16**
ER appointed/ total	**12/12**
Publications	**277**
Month in the project/ total	**41/48**

Universenet Publications

Please let us know about your PUBLICATIONS, talks, meetings attended, outreach activities, etc…

Please acknowledge the network's support: "This work was supported by the EU FP6 Marie Curie Research and Training Network "UniverseNet" (MRTN-CT-2006-035863)".

Inter-team publications (which acknowledge support) are important for our assessment!

Universenet website - http://www.physics.ox.ac.uk/universenet/

Find time to visit our website and send us suggestions, corrections, ideas!!
We keep our website up-to-date and with (hopefully!) useful information: Publications, ESR-ER researchers, Events, Outreach, and others …

If there is anything you would like posted in future Bulletins, please contact me (Claire Potter) at: *universenet@physics.ox.ac.uk*