

# Opening of Invisibles I 3

Welcome and useful information

## Invisibles I 3

Lumley Castle, Durham County  
15 July 2013

Silvia Pascoli



IPPP - Durham University



# Welcome to all!

**Exciting time after the discovery of theta 13 and many experiments providing data at the LHC, in neutrino and dark matter physics.**



# Programme

invisibles13

Invisibles13 Workshop, 15th-16th July



Monday 15th	Tuesday 16th	Wednesday 17th
	<b>The Status of the Flavour Problem</b>	<b>Neutrino Masses Beyond the Standard Model</b>
	A Perspective on the Flavour Problem <b>Benjamin Grinstein</b> ( <i>UC San Diego</i> ) (09:30-09:55)	Current Status of Neutrinoless Double Beta Decay Searches <b>Patrick Decowski</b> ( <i>Nikhef &amp; University of Amsterdam</i> ) (09:00-09:25)
	Mass Hierarchy and CP Violation from Long Baseline Experiments <b>Brajesh Choudhary</b> ( <i>University of Delhi</i> ) (10:10-10:35)	New Results from GERDA <b>Laura Baudis</b> ( <i>University of Zurich</i> ) (09:25-09:40)
	Coffee Break (10:10-11:20)	Status of Neutrino Mass Models <b>Graham Ross</b> ( <i>University of Oxford</i> ) (09:55-10:20)
	Neutrino and CP Violation <b>Pedro Machado</b> ( <i>Sao Paulo U/IIFT-Madrid</i> ) (11:20-11:45)	Neutrino Masses from TeV Scale <b>Shaaban Khalil</b> ( <i>Center for Theoretical Physics, Zewail City of Science and Technology</i> ) (10:35-11:00)
	A Review of Lepton Flavour Violating Processes <b>Vincenzo Cirigliano</b> ( <i>Los Alamos National Laboratory</i> ) (11:50-12:15)	Coffee Break (11:15-11:35)
	Opening Session <b>Silvia Pascoli</b> ( <i>IPPP, Durham University</i> ) (15:30-15:40)	<b>Hints Beyond Three Neutrinos</b>
	Bayesian model comparison with applications in neutrino physics <b>Johannes Bergström</b> ( <i>KTH Royal Institute of Technology</i> ) (12:30-12:55)	Reactor Anomalies and Searches of Sterile Neutrinos in Experiments at very Short Baseline <b>Guillaume Mention</b> ( <i>CEA Saclay</i> ) (11:35-12:00)
	News from the LHC <b>Joe Incandela</b> ( <i>UCSB/CERN</i> ) (15:40 -16:05)	Kolar Gold Field and Ice Cube <b>Sir Arnold Wolfendale</b> ( <i>Durham University</i> ) (12:15-12:40)
	Lunch (13:00 -14:30)	Discussion Session Chair: <b>Stefano Rigolin</b> ( <i>Universita' di Padova e INFN Padova</i> ) (12:55-13:25)
	Results from Planck <b>Julien Lesgourgues</b> ( <i>CERN and Institut de Physique Theorique Lausanne</i> ) (16:15-16:40)	Lunch (13:30-14:30)
	<b>The Neutrino Mass Hierarchy: How Will We Determine it?</b>	Visit to Durham and the Lindisfarne Gospels Exhibition (15:00)
	New Ideas on Neutrino Mass Measurements <b>Alvaro De Rujula</b> ( <i>CERN</i> ) (14:30-14:55)	
	Coffee Break (16:50-17:20)	
	Determining the Mass Hierarchy from Reactors <b>Wei Wang</b> ( <i>College of William and Mary</i> ) (15:10-15:35)	
	Coffee Break (15:50-16:20)	
	Perspective on Neutrino Physics <b>Pilar Hernandez</b> ( <i>University of Valencia</i> ) (17:20-17:45)	
	The Determination of the Mass Hierarchy from PINGU and ORCA <b>Justin Evans</b> ( <i>University of Manchester</i> ) (16:20-16:45)	
	The Experimental Neutrino Programme <b>Takaaki Kajita</b> ( <i>Institute for Cosmic Ray Research, Univ. of Tokyo</i> ) (17:55-18:20)	
	The Mass Hierarchy from Supernova Neutrinos <b>Alessandro Mirizzi</b> ( <i>II Institute for Theoretical Physics</i> ) (17:00-17:25)	
	Discussion Session Chair: <b>Walter Winter</b> ( <i>Wurzburg University</i> ) (17:40-18:10)	
	Reception and Gala Dinner 19:30	Banquet in Durham Castle (19:45)
	Poster Session (18:10 - 19:10)	
	Dinner (20:00)	
	Bus returns to St. Aidans (22:30)	
	Whisky Tasting Session (21:30)	
	Bus returns to St. Aidans (22:30)	Bus returns to St. Aidans (22:30)

## Opening session

J. Incandela: News from LHC

J. Lesgourgues: Results from Planck

P. Hernandez: Prospectives on neutrino physics

T. Kajita: The experimental neutrino programme

Talks and discussion

Addition to the programme:

Laura Baudis (UZH)

New results from GERDA

Thursday 18th	Friday 19th
<b>Scales in Dark Matter, Neutrinos and Higgs</b>	<b>Exotic Dark Matter</b>
Different Scales for Higgs Physics <b>John Ellis</b> ( <i>King's College London/CERN</i> ) (09:00-09:25)	Dark Matter Operators <b>Jernej Kamenik</b> ( <i>Jozef Stefan Institute, Ljubljana</i> ) (09:00-09:25)
Different Energy Scales at the origin of Neutrino Masses <b>Sacha Davidson</b> ( <i>IPN de Lyon</i> ) (09:40-10:05)	Particle Dark Matter Models Beyond Minimal WIMPS <b>Pospelov Maxim</b> ( <i>Perimeter Institute for Theoretical Physics</i> ) (09:40-10:05)
Confronting Different Mass Scales for Dark Matter <b>Michel Tytgat</b> ( <i>Universite Libre de Bruxelles</i> ) (10:20-10:45)	Review of Light Dark Matter and Hidden Photons <b>Joerg Jaeckel</b> ( <i>ITP Heidelberg</i> ) (10:20-10:45)
Coffee Break (11:00-11:20)	Coffee Break (11:00-11:20)
New Ideas in Dark Matter Models and their Tests <b>Neal Weiner</b> ( <i>New York University</i> ) (11:30-11:55)	Warm Dark Matter vs. Cold Dark Matter: Large Scale Structure Simulations <b>Carlos Frenk</b> ( <i>Institute for Computational Cosmology, Durham University</i> ) (11:30-11:55)
Searches of Dark matter at the LHC <b>Patrick Fox</b> ( <i>Fermilab</i> ) (12:10-12:35)	Neutrino Cosmology <b>Steen Hannestad</b> ( <i>Aarhus University</i> ) (12:10-12:35)
Lunch (12:50-14:20)	Neutrino Oscillations, Neff and Cosmological Constraints: Role of the Sterile Neutrino <b>Ninetta Saviano</b> ( <i>Hamburg University</i> ) (12:50-13:15)
	Lunch (13:20-14:30)
<b>Tests of Dark Matter</b>	<b>Alternatives to Vanilla Cosmology</b>
Review of Direct Detection Experiments <b>Teresa Marrodán Undagoita</b> ( <i>Max-Planck-Institut für Kernphysik</i> ) (14:20-14:45)	Spontaneous B-L Breaking at the Origin of the Hot early Universe <b>Valerie Domcke</b> ( <i>DESY</i> ) (14:30-14:55)
Galactic Distributions <b>Anne Green</b> ( <i>University of Nottingham</i> ) (15:00-15:25)	New Perspectives on the Origin of the Matter-Antimatter Asymmetry <b>Jim Cline</b> ( <i>McGill University</i> ) (15:00-15:25)
Coffee Break (15:40-16:00)	Coffee Break (15:40-16:10)
Gamma-ray tests of dark matter: EGB and anisotropies <b>Valentina De Romeri</b> ( <i>IFIC Valencia</i> ) (16:00-16:25)	What Have Neutrinos to do with Dark Energy? <b>Christof Wetterich</b> ( <i>Institute for theoretical physics</i> ) (16:10-16:35)
Indirect Dark Matter Detection <b>Gabrijela Zaharijas</b> ( <i>ICTP</i> ) (16:30-16:55)	Review of Dark Energy in Non-Minimal Models <b>Olga Mena</b> ( <i>IFIC-CSIC/UV</i> ) (16:50-17:15)
Discussion Session Chair: <b>Marco Cirelli</b> ( <i>IPhT CNRS Saclay</i> ) (17:10-17:40)	Discussion Session Chair: <b>Andrea De Simone</b> ( <i>SISSA/CERN</i> ) (17:30-18:00)
Science and Art Session (18:00-20:00)	Dinner (20:00)
Dinner (20:00)	
Bus returns to St. Aidans (22:30)	Bus returns to St. Aidans (22:30)

# Poster session on Tuesday at 18:10

# Castle facilities

**Lunch:** Barons Hall and Scarborough Room

**Dinner:** Garter Room and Waterford Room

**After dinner events:** Barons Hall

**Working Office:** Northumbria Room (second floor)

**Telecon/restricted discussions:** Cuthberth Room (to be booked via U. Jakobsen)

# **Visit to Durham on Wednesday afternoon**

do not miss Durham Cathedral (closes at 4:15-4:30)

Lindisfarne Gospels

Banquet in Durham Castle

## **Invisibles Art Event**

Invisibles ITN has partnered with a group of artists from the North-East of England: the Invisibles Art Group. New art exposition open to the public on Thursday

# Invisibles Art Group

Steve Sproates, Chrissie Morgan, Bruce Burn, Catherine Yates, Bill Harris, Dawn Douglas, Michael Grogan, Angela Sandwith, Maggie Parker

ITN Invisibles  
Durham University

# Invisibles Art

an original exhibition exploring science with art  
with the opening by Prof. Sir Arnold Wolfendale FRS

18 July 2013 18:00-19:30

Lumley Castle Hotel, Chester le Street, DH3 4NX

Credit: NASA, ESA, CXC, M. Bradac and S. Allen

# Opening Session

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News from the LHC  
**Joe Incandela** (*UCSB/CERN*)  
(15:40 -16:05)

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Results from Planck  
**Julien Lesgourgues** (*CERN  
and Institut de Physique  
Theorique Lausanne*)  
(16:15-16:40)

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Coffee Break (16:50-17:20)

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Perspective on Neutrino Physics  
**Pilar Hernandez** (*University of  
Valencia*)  
(17:20-17:45)

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The Experimental Neutrino  
Programme  
**Takaaki Kajita** (*Institute for  
Cosmic Ray Research, Univ. of  
Tokyo*)  
(17:55-18:20)

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Reception and Gala Dinner  
19:30