

# XIII International Workshop on NEUTRINO TELESCOPES Un altro modo di guardare il cielo

## Tribute to Galileo



### *Galileo in Padova (1592-1610)*

*"I diciotto anni migliori di tutta la mia età"*

*Al p. Camp: io stimo più il tremor 'u vero bened di cosa lappiera et l'disputar lungo delle maxime  
questioni senza conseguir verità nessuna*

*Most highly I esteem a trilling truth  
About the merest mote, but do despise  
Unending disputations seeking scotch  
O'er great eternal quests that yield but lies.*  
(Trans. Chris Quigg)



## Un altro modo di guardare il cielo

**Tuesday, March 10, 2009**

09.15 – 09.30     **M. Baldo Ceolin** (University of Padova)  
*Welcome*

*Chair: C. Quigg* (FERMILAB)

09.30 – 10.10     **A. van Helden** (University of Utrecht)  
*Galileo and his Telescope*

10.10 – 10.45     **F. Halzen** (University of Wisconsin)  
*The Neutrino Telescopes*

10.45 – 11.15     **Coffee Break**

# NEUTRINO TELESCOPES

*We have already got*

## *Great Examples of Neutrino Physics with Neutrino Telescopes*

**Chair: H. Sugawara** (JSPS, Washington)

11.15 – 11.50     **A. McDonald** (Queen's University, Kingston)  
*SNO-Studying the Sun and Neutrino Properties*  
[Neutrinos do change their Flavour!]

11.50 – 12.25     **A. Suzuki** (KEK)  
*KamLand: Studying Neutrinos from Reactor*  
[The First Observation of the Oscillation Cycle!]

12.25 – 13.00     **GL. Fogli** (University of Bari)  
*SNO, KamLand and Neutrino Oscillations:  $\theta_{13}$*

13.00 - 14.30     **Lunch**

**Chair: V. Gavrin** (INR of RAS, Moscow)

14.30 – 15.05     **C.H. Albright** (Northern Illinois University & FERMILAB)  
*Overview of Neutrino Mixing Models and Ways to differentiate among them*

15.05 – 15.40     **G. Testera** (INFN, Genova)  
*Low Energy Solar Neutrino Signals in BOREXINO*

15.40 – 16.15     **C. Peña-Garay** (IAS, Princeton)  
*Solar Neutrinos and the Solar Composition*

16.15 - 16.40     **Coffee Break**

**Chair: S. Pakvasa** (University of Hawaii)

16.40 – 17.15     **M. Nakahata** (University of Tokyo)  
*Kamiokande and Super-Kamiokande Results on Neutrino Astrophysics*  
[Opening a New Era in Neutrino Physics!]

17.15 – 17.50     **W.G. Scott** (RAL)  
*A Flavour-Symmetric Perspective on Neutrino Mixing*

**Chair: T. Weiler** (Vanderbilt University)

17.50 – 18.25

**J. Bernabeu** (IFIC, Valencia)

*CP Violation in Neutrino Oscillations without Antineutrinos:  
Energy Dependence*

18.25 – 19.00

**D. Meloni** (University of Roma Tre)

*CP Violation in Neutrino Physics and New Physics*

**Wednesday, March 11, 2009**

*What comes next*

***Astrophysics with Neutrino Telescopes***

**Chair: C. de los Heros** (University of Uppsala)

08.45 – 09.15 **Zh. Dzhilkibaev** (INR of RAS, Moscow)  
*The BAIKAL Neutrino Telescope*

09.15 – 09.50 **C. Spiering** (DESY, Zeuthen)  
*The European Strategy on Astroparticle Physics*

**Chair: P.O. Hulth** (Stockholm University)

09.50 – 10.20 **K. Hoffman** (University of Maryland)  
*AMANDA and IceCube Results*

10.20 – 10.50 **V. Flaminio** (University of Pisa)  
*ANTARES “The First Undersea Telescope”*

10.50 – 11.15 **Coffee Break**

**Chair: E. Calligarich** (University of Pavia)

11.15 – 11.45 **D. Saltzberg** (UCLA)  
*The ANITA Experiment*

11.45 – 12.15 **S. Enomoto** (Tohoku University)  
*Using Neutrinos to study the Earth*

**Chair: M.T. Muciaccia** (University of Bari)

12.15 – 12.45 **D.F. Cowen** (Penn State University)  
*The Physics Potential of IceCube’s Deep Core Sub-Detector*

12.45 – 13.15 **M. Maltoni** (IFT & Autonoma University, Madrid)  
*Synergies between Future Atmospheric and Long Baseline Neutrino Experiment*

13.15 - 14.45 **Lunch**

*Which way*

## ***New Generation of Neutrino Detectors***

***Chair: J. Schneps*** (Tufts University)

- 14.45 – 15.20     **S. Katsanevas** (Université de Paris 7)  
*Toward a European Megaton Neutrino Observatory*
- 15.20 – 15.55     **K. Lande** (University of Pennsylvania)  
*Megaton Detector at Homestake*
- 15.55 – 16.30     **H. Yuksel** (University of Delaware)  
*Core Collapse Astrophysics with a Five-Megaton Neutrino Detector*
- 16.30 – 17.00     **Coffee Break**

## ***Exploring New Frontiers with the New Generation of Neutrino Telescopes***

***Chair: G. Barenboim*** (University of Valencia & IFIC)

- 17.00 – 17.30     **E. Lisi** (INFN, Bari)  
*Core-Collapse Supernovae: When Neutrinos get to know Each Other*
- 17.30 – 18.00     **G. Bignami** (IUSS, Pavia)  
*Neutrinos from Neutron Stars*
- 18.00 – 18.30     **D. Fargion** (University of Roma “La Sapienza”)  
*Neutrino Telescopes and Tau Neutrino*

Thursday, March 12, 2009

*What can we learn?*

***Tribute to Bruno Pontecorvo***

**Chair: A. Bottino** (University of Torino)

08.45 – 09.20

**S.M. Bilenky** (JINR, Dubna)

*Revisiting Pontecorvo's Original Ideas on Neutrinos*

09.20 – 09.55

**H. Minakata** (Tokyo Metropolitan University)

*Neutrino's Non-Standard Interactions; Another Eel under a Willow?*

**Chair: G. Fiorentini** (University of Ferrara)

09.55 – 10.30

**S.T. Petcov** (SISSA)

*Majorana Neutrinos and their Properties*

10.30 – 11.05

**S.K. King** (University of Southampton)

*Neutrino Mass Models*

11.05 – 11.30

**Coffee Break**

**Chair: G. Costa** (University of Padova)

11.30 – 12.05

**G. Altarelli** (University of Roma Tre & CERN)

*Recent Developments of Models of Neutrino Mixing*

12.05 – 12.40

**M. Lindner** (MPI, Heidelberg)

*Interpretations of Precision Neutrino Measurements*

**Chair: F. Vannucci** (APC, University of Paris 7)

12.40 – 13.10

**O. Blanch Bigas** (LPNHE, Paris)

*Update of the AUGER Neutrino Limits*

13.10 – 14.30

**Lunch**

*New Results and New Projects*

**Chair: G. Domokos** (The Johns Hopkins University)

14.30 - 15.05 **M.V. Diwan** (BNL)  
*Latest Results from MINOS*

15.05 – 15.35 **M. Mezzetto** (INFN, Padova)  
*Next Challenge in Neutrino Physics: the  $\theta_{13}$  Angle*

**Chair: M. Aguilar-Benitez** (CIEMAT, Madrid)

15.35 – 16.10 **T. Kajita** (Tokyo University)  
*Megaton Neutrino Observatory in the East Asia*

16.10 – 16.40 **W.C. Louis** (LANL)  
*MiniBooNE Results and the OscSNS Neutrino Project*

16.40 – 17.00 **Coffee Break**

**Chair: P. Vilain** (Université Libre de Bruxelles)

17.00 – 17.30 **F. Terranova** (LNF)  
*Neutrino Oscillation in the CNGS Neutrino Mu Beam*

17.30 – 18.00 **J. Cao** (Institute High Energy Physics, Beijing)  
*Daya Bay Reactor Neutrino*

18.00 – 18.30 **J. Dawson** (APC, Paris 7)  
*Double Chooz*

**Friday, March 13, 2009**

*An ultimate Goal?*

***Astrophysics and Cosmology***

***Chair: D. Haidt*** (DESY)

- 09.00 – 09.35     **A. Giazotto** (INFN-EGO, Pisa)  
*Gravitational Waves: Toward First Detection*
- 09.35 – 10.10     **D. Puy** (University of Montpellier)  
*Cosmic Microwave Background and First Molecules in the Early Universe*
- 10.10 – 10.45     **A. Melchiorri** (University of Roma “La Sapienza”)  
*CMB Anisotropies, Current Status and Perspectives*
- 10.45 – 11.15     **Coffee Break**

***Chair: P. Binetruy*** (APC, Université Paris Diderot)

- 11.15 – 11.50     **PG. Picozza** (INFN, Roma “Tor Vergata”)  
*PAMELA*
- 11.50 – 12.25     **M. Cirelli** (IPhT-CEA, Saclay)  
*PAMELA, ATIC and Dark Matter*

***Chair: L. Maiani*** (CNR)

- 12.25 – 13.00     **C. Wetterich** (University of Heidelberg)  
*Growing Neutrinos as a Solution of the "why now" Problem for Dark Energy*
- 13.00 – 14.30     **Lunch**

***Chair: M. Baldo Ceolin*** (University of Padova)

- 14.30             **A. Suzuki** (KEK)  
*The Legacy of Y. Totsuka*

15.00 – 18.00

***Round Table: Plans for the Future***

**Chair: N. Cabibbo** (University of Roma “La Sapienza”)

**B. Barish** (CALTECH)

**L. Maiani** (CNR)

**V.A. Matveev** (INR of RAS, Moscow)

**H. Minakata** (Tokyo Metropolitan University)

**P.J. Oddone** (FNAL)

**R. Petronzio** (INFN, Roma)

**C. Rubbia** (CERN)

**M. Spiro** (CEA, Saclay)

**A. Suzuki** (KEK)