

May. 2009

## CURRICULUM VITAE of TERESA MONTARULI

### Personal Data

Citizenship: Italian

Foreign Languages: English. French and Spanish at basic level.

Work Address: University of Wisconsin, Department of Physics

1150 University Ave, 53706 Madison WI

Tel: +1-608-890-0901

E-mail: tmontaruli@icecube.wisc.edu

### Appointments

- Sep 2007** Tenured, Associate Professor (University of Wisconsin - Madison).
- Jan. 2006** Assistant Professor (University of Wisconsin - Madison and on leave of absence from University of Bari).
- Jan. 2005** Visiting Scientist (University of Wisconsin - Madison and on leave of absence from University of Bari).
- Oct. 2004** Tenured, Assistant Professor (University of Bari).
- Oct. 2001** Assistant Professor (University of Bari).
- 2000-2001** Research Associate on Neutrino Physics (Bari University).
- 1999-2000** PostDoc for experimental physicists (INFN, National Competition, 6<sup>th</sup> position).
- 1994** INFN fellowship in Particle Physics and Fundamental Phenomena (National Competition, 1<sup>st</sup> position).

### Education

#### 1995-1998 Ph.D. in Physics (University of Bari)

*“Atmospheric neutrino flux and search for astrophysical neutrinos. Measurement with MACRO at Gran Sasso”*, Thesis advisor: Prof. C. De Marzo (U. of Bari), co-advisor: Dr. F. Ronga (INFN, Laboratori Nazionali di Frascati), G. Battistoni (INFN, Milano). Thesis evaluation by Prof. G.L. Fogli (U. of Bari), Prof. T.K. Gaisser (Bartol Institute, Delaware). Official diploma dated Oct. 16, 1998.

**1994** Specialization Diploma in Physics (University of Bologna). Thesis Title: *“Upper limits on neutrino fluxes induced by WIMPs in the Sun and the Earth with MACRO”*.

**1993** Physics Laurea Degree (University of Bari), *summa cum laude*. Thesis title: *“Upward-going muon flux measurement with the MACRO detector”*, advisors: Prof. C. De Marzo (U. of Bari), Dr. F. Ronga (INFN, Labo-

ratori Nazionali di Frascati). Research activity: MACRO experiment at the INFN Gran Sasso National Laboratories.

## Awards and Honors

- 2008** Writing a review on Neutrino Telescopes for Annual Review of Nuclear and Particle Science.
- 2001** Shakti P. Duggal Award “Introduced in 1983 in recognition of significant contributions to cosmic ray physics by a young scientist of outstanding ability”, ceremony at the 27<sup>th</sup> International Cosmic Ray Conference, Hamburg. Published in Physics Today and available in <http://www.physicstoday.org/pt/vol-54/iss-10/p86a.html>.
- 2001-2** Grants for the development of an e-learning program for Laboratory of Linear Circuits and Optics, Department of Physics, University of Bari, [http://bibliowww.ba.infn.it/didattica/index\\_fis.html](http://bibliowww.ba.infn.it/didattica/index_fis.html).
- 1998** Bruno Rossi Award at Int. School of Sub-nuclear Physics “36<sup>th</sup> Course: from the Planck Length to the Hubble Radius” (Erice).
- 1996** Euro-conference Grant to attend VIIIth Rencontres de Blois, “Neutrinos, Dark Matter and the Universe” (France).

## Participation in Experiments and Projects

- 1993-2000** **MACRO** at the Gran Sasso National Laboratories of the INFN;
- 1999-2007** **NEMO R&D** for a km<sup>3</sup> neutrino telescope in the Mediterranean sea; **since 2000** **ANTARES**;
- 2005-2007** **KM3NeT R&D** for a km<sup>3</sup> neutrino telescope in the Mediterranean sea, recognized by ESFRI (European Strategy Forum on Research Infrastructures); **since 2005** **IceCube**;
- since 2007** Associate member of the **VERITAS** collaboration;
- 2006** Participated to (*Proposal to upgrade the MIPP Experiment*, P-960, hep-ex/0609057 and proposal to the Super Proton Synchrotron Committee of the NA49 Collaboration (*Study of Hadron Production in Hadron-Nucleus and Nucleus-Nucleus Collisions at CERN*, CERN-SPSC-2006-034).

## Grants and Proposals

- 2006-9** PI of Proposals for observations at WIYN 0.9m telescope.
- 2008** PI of Proposal to Graduate School University of Wisconsin, *Optical Monitoring with WIYN and multi-messenger / multi-wavelength study of AGNs*
- 2007-8** IceCube Analysis Proposal, co-investigator.
- 2003-4** PI of exchange program of scientists between the Spanish Research Institute CiCYT and the Italian INFN, *Search for point-like sources of astro-*

*physical neutrinos in ANTARES.*

## International Responsibilities and Designations

- 2009** PAG Program Prioritization Panel of the Astro2010: The Astronomy and Astrophysics Decadal Survey [http://www7.nationalacademies.org/bpa/Astro2010\\_Program\\_Prioritization](http://www7.nationalacademies.org/bpa/Astro2010_Program_Prioritization)
- since 2006** Member of IceCube Trigger Filter and Transmission Board.
- Reviewer of NSF proposals.
- 2005-7** Member of IceCube Publication Committee.
- since 2001** Member of ANTARES Publication Committee.
- since 2000** Coordinator of Astrophysics Working Group of ANTARES. Responsible for structuring the physics analysis of the experiment for neutrino astrophysics.
- since 2000** Responsible for the neutrino Monte Carlo generator of ANTARES.
- 2007** recommended by Istituto Nazionale di Fisica Nucleare -INFN to the European Commission as an expert in the 'Experimental astroparticle physics' research field, in order to assist the Commission in the evaluation of proposals of the Seventh Framework programs, in reviewing of funded projects, in monitoring and evaluation of research policy and programs.
- since 2006** 3.5m WIYN Telescope Allocation Committee at the University of Wisconsin.
- 1996** Representative of young INFN researchers at the meeting with INFN international referees (President: Prof. B. Richter).
- Referee of Astronomical Journal, Astroparticle Physics, JCAP, Astronomical Journal.
  - Expected to produce a review on High-Energy Neutrino detection and its Prospects in Annual Review in Nuclear and Particle Science.

## Organizer of Conferences and Chair of Sessions

- 2009** Organizer of NDM09, Madison, WI; Chair of High Energy Astrophysics Session at TAUP2009, Gran Sasso, Italy
- 2006** Organizer of the TeV Particle Astrophysics II Workshop in Madison, August 2006, <http://www.icecube.wisc.edu/tev>, more than 100 physicists attending from all over the world, proceedings under editorial process in Journal of Physics: Conference Series.
- 2005** Chair and organizer of the session on "High Energy Particles", New Views of the Universe, Kavli Institute Inaugural Symposium in honor of David Shramm, Chicago, Dec. 2005;  
Chair, organizer and final summary of the session "Software simulation and data analysis tools", II Workshop on Very Large Volume neutrino Telescopes, VLVnT2 (Catania, Italy, Nov. 2005)

**2004** Chair and organizer, with summary report, of the Session “Atlas Coelestis” of the Neutrino Oscillation Workshop, NOW2004 (Otranto, Italy, Sep. 2004)

## Invited Talks

- *Recent Results from IceCube*, American Physical Society Meeting, Denver, May 2009.
- *Searching for Astrophysical Neutrinos in Neutrino Telescopes*, The 2009 Snowbird Workshop on Particle Astrophysics, Astronomy and Cosmology, SNOWPAC2009, Utah, Feb. 2009.
- *The ANTARES underwater neutrino telescope*, Seventh Alexander Friedmann International Seminar on Gravitation and Cosmology, July 2008, Joao Pessoa, Brazil.
- *Neutrino Astronomy in Ice*, Neutrino Oscillation Workshop 2008 (NOW 2008), Conca Specchiulla, Italy, Sep. 6-12, 2008.
- *Neutrino Astronomy*, Cosmic Ray International Seminar “Ultra-High Energy Cosmic Ray Status and Perspectives (CRIS 2008)”, Salina, Italy, Sep. 15-19., 2008.
- *Recent Developments in High Energy Neutrino Astronomy*, International Astroparticle Physics Symposium, IAPS2008, May 6-9, 2008, Colorado, U.S.A.
- *IceCube and Multi-Messengers*, 2<sup>nd</sup> Multi-Wavelength Workshop for Next-Generation Gamma-Ray Experiments, Aug. 2007, Adler Planetarium, Chicago.
- *Status of IceCube*, Frontier Objects in Astrophysics and Particle Physics, Vulcano 2006, (Vulcano Island, Sicily, Italy, May 2006);
- *Neutrino Astronomy and Telescopes*, CRIS 2006, Cosmic ray International Seminar, Ultra-High Energy Cosmic Rays: Status and Perspectives (Catania, Italy, Jun 2006);
- *The ANTARES Neutrino telescope*, TeV Particle Physics I (Fermilab, IL, USA, July 2005);
- *Neutrino Astrophysics*, Electron-Nucleus Scattering –VIII Conference (Jun. 2004, Isola d’Elba, Italy);
- **Rapporteur Talk** on High Energy Phenomena Sessions at 28<sup>th</sup> Int. Cosmic Ray Conference (ICRC2003) (Tsukuba, Japan);
- *High energy Neutrino Astrophysics*, 8<sup>th</sup> Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP 2003) (Sep. 2003, Seattle, USA);
- *Astrophysics Neutrino Detection*, XV IFAE Workshop on High Energy Physics, (Apr. 2003, Lecce, Italy).
- *Neutrino measurement with MACRO: neutrino oscillation, dark matter*

- and astronomy studies*, School and Workshop on Neutrino Particle Astrophysics (Feb. 2002, Les Houches, France);
- *High energy neutrino astronomy and WIMP search results*, NATO Advanced Research Workshop, Cosmic Radiation from Astronomy to particle physics (Mar. 2000, Oujda, Marocco);
  - *Atmospheric Neutrino Production*, Les Houches Euro-conference on Neutrino Masses and Mixings (Feb. 2001, France);
  - *Neutrino Astronomy and Indirect Search for WIMPs*, Int. Workshop on Aspects of Dark Matter in Astro- and Particle Physics (DARK2000), (Jul 2000, Heidelberg, Germany);
  - *High Energy Neutrino Astrophysics*, LXXXVI National Congress of Scuola di Fisica Italiana (Sep. 2000, Palermo, Italy).
  - *The detection of Neutrinos, Monopoles and Indirect Search for WIMPs in the MACRO detector*, Conference on Beyond Standard Model Physics (BEYOND99) (Jun 1999, Castle Ringberg, Germany);
  - *Atmospheric and Astrophysics Neutrinos with MACRO*, Int. Workshop on Aspects of Dark Matter in Astro- and Particle Physics (DARK 98) (Jul 1998, Heidelberg, Germany);
  - *Upward-going muons and WIMPs in the MACRO detector*, DM-Italia-97, Workshop on Dark Matter (Dec. 1997, Trieste, Italy).
  - *Neutrino induced upward-going muons and WIMP search in the MACRO experiment*, Int. Workshop on Aspects of Dark Matter in Astro- and Particle Physics (DARK96) (Sep. 1996, Heidelberg, Germany).

## Talks at International Conferences

- *First Results of the IceCube Observatory on High Energy Neutrino Astronomy*, talk at TAUP2007, Topics in Astroparticle and Underground Physics, Sep. 2007, Sendai, Japan.
- *The ANTARES Neutrino telescope*, talk at PANIC 2005, Particles and Nuclei International Conference (Santa Fe, NM, Oct 2005)
- *Neutrino Astronomy with ANTARES*, XXXIV Int. Symposium on Multiparticle Dynamics (ISMD2004) (Sonoma County, CA, USA, Jul 2004)
- *Status Report of the ANTARES Project*, 7<sup>th</sup> Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP 2001) (Sep. 2001, Gran Sasso National Laboratories, Italy);
- *Results on high-energy atmospheric neutrino oscillations with MACRO*, 27<sup>th</sup> International Cosmic Ray Conference (ICRC2001) (Aug. 2001, Hamburg, Germany)
- *The measurement of upward going muons using the MACRO detector*, 6<sup>th</sup> Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP97) (Sep. 1997, Gran Sasso National Laboratories).

- *Neutrino induced upgoing muons in MACRO*, VIIIth Rencontres de Blois, Talk with Special Grant (Jun 1996, France);
- *Search for neutrinos from the Sun and the Earth with the MACRO detector*, 5<sup>th</sup> Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP95) (Sep. 1995, Toledo, Spain)

## Invited Lectures, Seminars and Colloquia

- *Recent IceCube Results*, Kavli Institute for Cosmological Physics (KICP), Chicago, Mar. 11, 2009.
- *Neutrino Telescopes Results*, University of Zürich, Dec. 17, 2008.
- *Neutrino Telescope Results*, CPPM, Marseille, Dec. 15, 2008.
- *Results from the Neutrino Telescopes IceCube and ANTARES*, University of Wisconsin-Milwaukee, Nov. 17, 2008.
- *Astronomy with Neutrinos and IceCube*, Physics Colloquium, University of Arizona, Tucson, Feb 15, 2008.
- *IceCube*, Argonne National Laboratory, IL, USA, Nov. 2007.
- *Astronomy with Neutrinos*, University of Arizona, Tucson, Feb. 2007.
- *Exploring the High Energy Universe with Neutrinos*, European Gravitational Observatory Seminar, Pisa, Italy, Mar. 2007.
- *Exploring the High Energy Universe with Neutrinos and Unusual Telescopes*, The Aachen University of Technology RWTH, Germany, Feb. 2007.
- *The progress in neutrino astronomy and news from IceCube*, Max Planck Institute for Astronomy, Heidelberg, Germany, Feb. 2007.
- *IceCube Status*, INFN, Commission for Astroparticle Physics Experiments (Commissione 2), Italy, Jan. 2007.
- *The Exploration of the High Energy Frontier with Neutrino Telescopes*, Colloquium at the University of Wisconsin, Department of Physics, Dec. 2006.
- *Neutrino Telescopes and their Mission*, Kavli Institute for Cosmological Physics (KICP) at The University of Chicago, Nov. 2006.
- *Starting Multi-wavelengths Campaigns*, Seminar at the University of Wisconsin, Department of Astronomy, Nov. 2006.
- *Neutrino Astronomy and Telescopes. The case of AMANDA and IceCube*, Physics colloquium at the University of Florida, Gainesville, Feb. 2006.
- *Neutrino Astronomy and Telescopes*, Milwaukee University, Nov. 2005.
- *Neutrino Astronomy and Telescopes. The case of AMANDA and IceCube*, University of Wisconsin, Department of Astronomy, Apr. 2005.
- *Neutrino Telescopes*, Spanish School of High Energy Physics (Alicante, Spain, Mar. 2004);

- *Neutrino Telescopes and the ANTARES Experiment*, Scuola Superiore Normale di Pisa (Pisa, Italy, 2004);
- *The MACRO experiment at Gran Sasso: neutrino measurement and other major results and Neutrino Astrophysics and Telescopes*, Colloquia at Wisconsin University (Mar. 2004, Madison, USA).
- *High energy neutrino telescopes*, Int. School on Astroparticle Physics (Jun. 2003, Conca Specchiulla, Italia);
- *Scientific Objectives of Neutrino Astronomy*, Inauguration of ANTARES Station (La Seyne sur Mer, France), attended by the Ministers of University and Research of France and Italy;
- *Current status of neutrino astrophysics experiments*, Padova University (2003)
- *The MACRO experiment at Gran Sasso: neutrino measurement and other major results and A status report on ANTARES*, Colloquia at Bartol Research Institute (Sep. 2002, Delaware, USA)
- *The ANTARES project: a neutrino telescope in the Mediterranean*, Pisa University (Pisa, Italy, 2002)
- *Neutrino Astronomy at Neutrino Telescopes*, INFN Gran Sasso National Laboratories (2001).
- *Atmospheric neutrinos: present experimental results and future prospects*, INFN Gran Sasso National Laboratories (1999);
- *Atmospheric neutrinos: experimental results and future perspectives*, Bari University (1999);
- *Search for neutrinos of astrophysical origin with MACRO and future perspectives*, Bologna University (1999);
- *Search for sources of neutrinos of astrophysical origin with MACRO and future perspectives*, INFN Frascati National Laboratories (1999)
- *MACRO results on neutrino oscillations*, INFN Frascati National Laboratories (1998).

## Lectures at International PhD Schools

- *Lectures of Neutrino Astronomy*, XX Seminario Nazionale di Fisica Nucleare e Subnucleare, Otranto, Sep. 2008.
- *Lectures on Neutrino Astrophysics*, Neutrino Factory School, Benasque, Spain, Jun. 2008.
- *Lectures of Cosmic Ray Physics*, XIX Seminario Nazionale di Fisica Nucleare e Subnucleare, Otranto, Sep. 2006.
- *Neutrino Astronomy and Telescopes*, Spanish School of High Energy Physics, Alicante, Spain, 2004.
- *High energy neutrino telescopes*, Int. School on Astroparticle Physics, July 2004, Conca Specchiulla, Italy;

- *Neutrino measurement with MACRO: neutrino oscillation, dark matter and astronomy studies*, School and Workshop on Neutrino Particle Astrophysics, Les Houches, France, 2002.

## Committees and Service Work

- 2007-8** Qualifier Exam for the graduate school of the University of Wisconsin; Colloquium Committee, Prelim Committee, Award Committee, L&S Faculty Appeals Committee;
- 2006** Qualifier Exam, Alumni Relation at the University of Wisconsin;
- since 2005** Served on PhD defense committees for You-Ren Wang, Jessica Hodges and Brennan Hughey, advisor Prof. Karle and Adam Everett, advisor W. H. Smith and on many prelim committees. Served prelim committees of J. Dumm, E. Strahler, K. Andeen, J. Braun, J. Kelley, C. Simmons.

## Teaching activity at the University of Wisconsin

- Phys 801: Instrumentation and Methods in Astroparticle Physics, Spring 2006**, <http://www.icecube.wisc.edu/%7etmontaruli/801.html>.
- Phys 208: General Physics, Fall 2006**, <http://uw.physics.wisc.edu/%7erzchowski/phy208/>.
- Phys 248: A Modern Introduction to Physics, Spring 2007**, [http://www.icecube.wisc.edu/%7eshiu/PHY248\\_S07/Physics248.html](http://www.icecube.wisc.edu/%7eshiu/PHY248_S07/Physics248.html).
- Phys 208: General Physics, Fall 2007**, <http://www.physics.wisc.edu/undergrads/courses/208-f07/index.html>.
- Phys 208: General Physics, Spring 2008** <http://www.physics.wisc.edu/undergrads/courses/spring08/208/index.html>

I designed the course **Phys 801: Instrumentation and Methods in Astroparticle Physics** for graduate students with the aim of illustrating the general subjects, current activities and methods applied in Particle Astrophysics. The course material covered Introductions on Special Relativity and Particle Physics, Interaction of Radiation with Matter, Particle Detectors and Astroparticle subjects, such as solar and atmospheric neutrinos, cosmic rays and their detection, including details on new techniques, such as radio, extensive air shower sampling, Atmospheric Imaging Cherenkov and fluorescence techniques; Gamma and Neutrino Astronomy where addressed in detail; Gravitational Wave theory and detection were treated at the end of the course. The main original effort was devoted to development of modules and exercises for the graduate students to allow them to use modern analysis tools, such as the object-oriented framework ROOT, widely used in the high-energy community, including code development in C++. The final exam consisted of a research project wherein students selected astrophysical sources of interest for gamma and neutrino astronomy, they explained the source main features that made them good candidates for high-energy particle acceleration, and they calculated

predicted event rates a Neutrino Telescope. They applied kinematics relations that they had learned during the course. The course was attended by 8 graduate students, and their evaluations were mostly 5s and some 4s, where 5 is the maximum.

Since 2005 I have been collaborating in the frame of the **Symbiosis II project: Physics for Biology for Madison** to modify the contents of Phys 207/Phys208 to better fit the needs and the future outcome of the students attending the course (Bachelors of Science in Biology and other Life Sciences). In order to make Phys 208 a multidisciplinary physics course, lectures, discussion sessions and laboratories include connections between Physics and other Life Sciences, for instance capacitors and RC circuits are explained and applied to cell membranes and ion channels, ion charges and solutions are described as well as conductors and semiconductors, the human vision and the rainbow formation are discussed during optics lectures, quantum mechanics and its applications to molecules, atoms and nuclei are described. Lectures were enriched by practical demos to illustrate in a realistic way physics phenomena. A program for Honor Lectures comprised lectures by Professors in Medical sciences, Biology, Biochemistry and Physics. Laboratories included new modules connected to items presented during lectures, for instance the polarization of sugar, and hand-outs were distributed with questions that helped in the understanding of the experiment. The online homework system, Mastering Physics <http://session.masteringphysics.com/> was firstly successfully applied in a Physics Course in the Department of Physics at UW. In Fall 2007 the students register for the course where 139 and in Spring 2008 they raised to 250.

In Spring 2006, I taught **Phys 248: A Modern Introduction to Physics** with Prof. G. Shiu. The course comprised 39 students, mainly physics majors. The course comprised a relevant part on Modern Physics, including quantum mechanics and general relativity, as well as electromagnetism.

## Other Lecture Series at the University of Wisconsin

- **Phys 725 (Spring 2008):** Invited lecture on Neutrino Properties.
- **Phys 772 (Spring 2005):** Invited lectures on Neutrino Astronomy (in <http://www.icecube.wisc.edu/%7etmontaruli/>).
- **Phys 301 (Fall 2005):** Invited Lecture on Neutrino Astrophysics.

## Advising at the University of Wisconsin

I closely follow the analysis work of all graduate students involved with the IceCube Project. Two weekly meetings, one for the entire group and one for the IceCube simulation group, are organized and lead primarily by me and Prof. Karle. I am in continuous email contact with the students, and always available to meet with them.

*Supervision of Post-Docs and Visiting Scientists*

I currently supervise:

- Patrick Berghaus (second year). I have been funding (start up budget) Patrick since 2007. Recently we published a work on charm production in the atmosphere (Ref. A7)[62].
- Chad Finley (third year). I have been funding the work of Chad Finley (Graduated at Columbia University on HiRes) since June 2006. He is working with me on the point-source analysis for IceCube (first results presented at the ICRC 2007 Conference in Mexico and at TAUP 2007 in Japan). Our work is also described in Ref. A7)[61].

I collaborate with many postDocs and worked directly with:

- Hagar Landsman (since 2005). I have worked closely with Hagar Landsman on developing a model for the emission of high-energy photons and neutrinos from the magnetar flare of SGR 1806-20 (Ref. B2)[3]).
- Juan de Dios Zornoza (2005-2007). I worked with Juan de Dios Zornoza, a post-doc with a Marie Curie Fellowship, on the experimental analysis of AMANDA-II data from this flare (Ref. A2)[10]).
- Alessio Tamburro (summer 2005). I hosted and funded two of my former students from the University of Bari who, who I supervised for their laurea degrees. Alessio Tamburro developed a module with me for any neutrino flux calculation that is now widely used by members of the IceCube collaboration to estimate backgrounds.
- Francesco Depalma (summer 2006) (Ref. A7)[61]. Francesco De Palma developed a sophisticated cluster algorithm for point-like source analysis, based on the expectation maximization likelihood method for ANTARES and IceCube.
- Dima Chirkin (since 2007)

#### *Supervision of graduate students*

- Jon Dumm (Summer 2005 to present) - formal advisor, prelim in Dec. 2007, point-source analysis of IceCube data;
- Mike Baker (Summer 2007 to present) - formal advisor, time dependent point-source analysis and multi-wavelength campaigns;
- Christine Lewis (Summer 2007-May 2008) - advisor, atmospheric neutrino analysis in IceCube and on calculations of atmospheric neutrino fluxes;

#### *Supervision of undergraduates*

- Joel Bressieux (from Ecole Polytechnique Federale de Lausanne to work on his Master thesis, supervisor in Lauranne: Matthieu Ribordy);
- Kristin Rosenau (REU student, summer 2008);
- Robert Joynt (summer 2008);
- Sujeet Sakula (summer 2008);

- Sam Flynn (since summer 2007);
- Anthony Pavkovich (concluded);
- Nicole Fields (REU student, summer 2007);
- Matthew Bayer (concluded);
- Melissa Jacquart (concluded);
- Erin Conrad (concluded);
- A.J. Heroux (REU student, summer 2005);
- K. Larson (REU student, summer 2006).

Erin Conrad won the Durand Scholarship in Summer 2006 and worked with me on the Moon shadow search with atmospheric muons measured in AMANDA-II. Four REU students, A.J. Heroux, K. Larson, N. Fields and K. Rosenau, worked on AMANDA/IceCube projects in Summer 2005, 2006, 2007, 2008, respectively. All of them were selected to present posters at the American Astronomical Society as a reward for their research program on the Moons shadow with AMANDA and IceCube (Heroux); multi-wavelength campaign among the IceCube, VERITAS and WIYN telescopes (Larson and Fields); first all sky measurement of the atmospheric muon and neutrino flux with 22 strings of IceCube (Rosenau).

## Teaching activity at the University of Bari, Italy

Since Oct. 2001 I am an Assistant Professor at the University of Bari, with tenure since Oct. 2004, since Jan. 2005 on leave of absence. I have taught the following Courses:

- Fall 2001:**
1. **Fundamental Physics I (Mechanics)**, Dep. of Telecommunications, Engineering, Polytechnic University of Bari; number of students 160.
  2. **Laboratory of Physics II (first part: electromagnetism)**, Physics Dept., number of students 40; for this course (part I and II) I developed a web page for which I got a **teaching grant** for 2 consecutive years. It was estimated that the average of the grades of the students attending the course increased by about 5 grades/30 in 2 years. The web page, nowadays still used in the Course, is at: [http://bibliowww.ba.infn.it/didattica/index\\_fis.html](http://bibliowww.ba.infn.it/didattica/index_fis.html).
- Spring 2002:**
1. **Fundamental Physics II (Electromagnetism, Optics and Modern Physics)**, Dep. of Telecommunications, Engineering, Polytechnic of Bari; 150 students.
  2. **Laboratory of Physics II (second part: optics)**, Physics Dept., 40 students.
- Fall 2002:**
1. **Fundamental Physics I (Mechanics)**, Electronics Engineering, Polytechnic of Bari; 180 students.
  2. **Laboratory of Physics II (first part: electromagnetism)**,

Physics Dep., 40 students.

- Spring 2003:**
1. **Fundamental Physics II (Electromagnetism, Optics and Modern Physics)**, Electronics Engineering, Polytechnic of Bari, 180 students.
  2. **Laboratory of Physics II (second part: optics)**, Physics Dept., number of students 40.
- Fall 2003:**
1. **Fundamental Physics I (Mechanics)**, Electric Engineering, Polytechnic of Bari; 80 students.
  2. **Laboratory of Linear circuits**, at the **Department of Physics**, 40 students.
- Spring 2004:**
1. **Fundamental Physics II (Electromagnetism, Optics and Modern Physics)**, Electric Engineering, Polytechnic of Bari, 80 students.
  2. **Laboratory of Optics**, Physics Dept., 40 students.
- Fall 2004:**
1. **Fundamental Physics I (Mechanics)**, Electric Engineering, Polytechnic of Bari, 80 students.
  2. **Laboratory of Linear circuits**, Physics Dept., 40 students.

### **Advising of Undergraduate Students at the University of Bari** (*Equivalent to a Masters level Thesis in the U.S.A.*)

- “Study of an underwater cosmic neutrino telescope: the NEMO project”, student M. Romita, mark: 110/110;
- “Search for high energy astrophysical neutrinos with the MACRO detector”, student C. Cupertino, *summa cum laude*;
- “The ANTARES neutrino telescope. Calculation of expected rates from point-like sources”, student A. Balenzano, *summa cum laude*;
- “The sensitivity of the ANTARES neutrino telescope for neutrinos in coincidence with gamma-ray bursts”, student: A. Tamburro, 110/110;
- “Simulation of all flavor neutrino signal. The case of ANTARES”, student: A. L’Abbate, *summa cum laude*;
- “Study of the ANTARES performance”, F. De Palma, *summa cum laude*;
- “The atmospheric neutrino flux and its prompt component”, student: A. Bruno, 109/110.
- “Clustering Algorithms in Astroparticle Physics”, F. De Palma, Master Thesis, ongoing. The student was hosted at UW on her funds to collaborate to the IceCube Project.

### **Research Activity**

Up to now my research activity has been developed in the framework of Astroparticle Physics, with particular attention to Neutrino Physics from the ex-

perimental and phenomenological points of view. This activity requires a very good knowledge of software tools and methods for data analysis and simulations, experience in detector calibrations, knowledge on data acquisition and some hardware knowledge.

The main topics I have studied are neutrino oscillations in atmospheric neutrinos and high energy neutrino astrophysics. My Masters Thesis and PhD studies showed evidence for neutrino oscillations using the MACRO detector, an important milestone toward the solution of the atmospheric neutrino problem (see Refs. A6) [26, 30, 36, 42, 43, 50, 51] of Publication list and Internal Notes D) [1-10]. I also performed the indirect search for WIMPs (Ref. A5) [46]) and for astrophysical neutrinos (Ref. A5) [41,31]). The pioneering work on Neutrino Astronomy in MACRO allowed me to assume a leading role when I entered ANTARES. Since then I have been leading the studies and analysis work on this major item for the experiment and I am conducting the main analysis for point-sources in IceCube, experiment that now takes most of my time. I am still involved in analyses of atmospheric muon and neutrinos. I have participated in the NEMO project for the R&D on a km<sup>3</sup> underwater detector where I had a very important role in setting up the simulation of the proposed detector.

Besides my experimental activity, I work on more theoretical and phenomenological aspects connected to cosmic ray physics, particle interactions and Dark Matter. The main effort started in 1999, is the development of an atmospheric neutrino calculation based on the FLUKA transport and interaction code in collaboration with G. Battistoni, A. Ferrari and P.R. Sala. To this purpose, we fully simulated the Earth atmosphere and the shower development. This has been the first published three-dimensional calculation, since previously secondaries were considered collinear with respect to parent neutrinos. This calculation is now widely used in the physics community. It triggered other precise calculations and comparisons with data from collider and cosmic ray experiments. The most recent paper using this calculation, Ref. A7)[66], represents the first estimate of atmospheric neutrino fluxes at energies < 100 MeV. Others have used this estimate for the irreducible background of relic neutrinos coming from supernova collapses. The works that describe more extensively the calculation and the benchmarks we made are in Ref. A6)[69-71].

I participated also in a calculation on neutrino fluxes from Dark Matter (such as neutralinos) particle annihilations in the core of the Sun and the Earth (see Ref. A7)[65]). My role in this work has been to implement the all flavor estimates, including tau neutrino fluxes and their propagation, and investigating the signatures in neutrino telescopes. I also have been working on a model on neutrino emission from a microquasar in collaboration with Felix Aharonian from the HESS experiment and Luis Anchordoqui (see Ref. B2)[4]). Moreover, with Luis Anchordoqui and Francis Halzen we worked on estimates of neutrino events in IceCube from proton proton interactions that would produce the TeV signal in Milagro from Cygnus (Ref. A7)[64]). With J. Ranft and P. Berghaus (Ref. A7)[63] we have been working on benchmarking the hadronic model DPMJET against charm production data and we have modified the code

to account for important effects for charm production in the atmosphere. This code has been introduced in CORSIKA and represents an important tool to simulate a very dangerous and persistent background for neutrino telescopes. Below I describe in detail my contributions to the various experiments.

### **IceCube Project**

IceCube is a cubic-kilometer neutrino detector under construction at the South Pole. When completed in 2011, it will be composed of 4800 photomultipliers (PMTs) along 80 strings and by an extensive air shower array called IceTop. Its precursor, AMANDA, is currently taking data in the same site with about 600 PMTs. When I joined the group in Madison, I took responsibility for the data filtering of the AMANDA detector for 2005, leading a group of Post-Doc and PhD students. This work was accepted by the collaboration and is being adopted as a reference for the ongoing online filtering. Important changes have concerned the treatment of the cross-talk filtering and of the reconstruction. The filtered data for the years 2005-6 are being added to the 2000-4 statistics and we are publishing the final analysis for point-sources with AMANDA-II (see Ref. A2)[2]) and we are working on the atmospheric neutrino final analysis. I am now leading the UW group that is working on the point-like neutrino source search in IceCube (see Ref. A7)[62]).

In collaboration with two Post-docs, I first estimated the expected muon and neutrino fluxes from a gigantic flare occurred in Dec. 2004 from the SGR 1806-20 magnetar, located above the horizon of AMANDA (see Ref. B2)[3] in List of Publications). Subsequently we developed the first analysis of the muon signal from a gamma source in AMANDA finding no positive detection and setting upper limits. This was the first time that AMANDA was used as a gamma-ray telescope, rather than a neutrino one (see Ref. A2)[11] ).

I have been developing two C++ modules relevant for the IceCube data and simulation software framework, IceTray. The first one is the coordinate transformation module between the local reference frame of the detector and the celestial systems and the other one provides a library of neutrino fluxes (atmospheric and astrophysical). These modules are already used extensively by the entire collaboration.

I have been a member of the IceCube Publication Committee between 2005-7. This committee is responsible for the publications, the proceedings and transparencies for Conferences attended by members of the Collaboration.

I am a member of the Trigger Filter and Transmission Board since when the committee was formed in 2007. This is the advisory board for IceCube detector operations, specifically for determining DAQ software, trigger settings and satellite transmission resources. It is meant to be an interface between analysis working groups and the construction and operation portions of the project. At the South Pole I have been commissioning the new strings for IC40, which made me familiar with the front-end electronic and the DAQ software.

### **ANTARES experiment**

My main responsibility in the experiment is to coordinate the Astrophysics Working Group (AWG), which studies the items connected to the main goal of the experiment, the detection of neutrinos of astrophysical origin. Now that the experiment is complete, I am proposing a structure and rules for the blinded analysis that will be performed when data become available. ANTARES is a Cherenkov underwater neutrino telescope at the scale of  $\sim 0.1 \text{ km}^2$  that is under deployment at 2.5 km below sea surface along the Marseilles coastline. It consists of about 900 optical modules (pressure resistant glass spheres containing 10 inch PMTs) along 12 strings anchored on the sea bed and kept tight by buoys. The experiment has 12 lines taking data since May 2008. It is responsibility of the coordinator to suggest and discuss items of interest for the AWG and during each plenary meeting I chair a session where people present their studies and I summarize it in the plenary session. I am also responsible for maintaining a WEB page where all the useful codes and astrophysics tools are available to the Collaboration, and where relevant plots of the group are collected.

Besides the coordination work, I am the main author of the neutrino generator used in the ANTARES to simulate the signal and the background (see Ref. A7) [67, 68] and Internal Notes D) [12-18] ). This simulation is the first step in the software chain of the experiment: the physics generator, the detector response simulation and the reconstruction. It is now used by the entire collaboration. The main effort consisted of simulating all possible neutrino interactions in the Earth, including lepton propagation in the instrumented region of the detector. I have also developed analysis tools based on the ROOT C++ framework and structured the information contained in data files. I led the massive production of neutrino signals and background now used for all performance studies. Moreover, I worked on the development of point-like source search methods (Ref. C) [10,5] of Conference Proceedings and D) [11] of Internal Notes).

### **MACRO experiment**

I worked in the MACRO experiment from 1993 to its conclusion in Dec. 2000. Collaborating with Dr. F. Ronga, I developed the first neutrino analysis in the experiment. The results of this analysis were chosen as the official ones to be published. The MACRO underground detector, located under the Gran Sasso mountain, was a liquid scintillator and tracking device. Upward-going muons, induced by atmospheric neutrinos, could be singled out from the downgoing atmospheric muon background more than 6 orders of magnitude larger. The direction of flight, determined using the time-of-flight measurement between layers of scintillators, and the track reconstruction of the streamer tubes indicated that muons were induced by neutrinos. In fact they are the only known particles that can penetrate the Earth and appear as upward-going induced muons. My main contributions to this analysis concerned the offline calibration of liquid scintillators using atmospheric muons, that achieved a time resolution of 600 psec; the characterization and optimization of analysis cuts; the determination of efficiencies and of the acceptance using the full Monte Carlo;

the determination and reduction at the 5% level of the systematic error of this measurement. The angular distribution of neutrino events indicated that muon neutrinos oscillate into tau neutrinos with maximal mixing and  $\Delta m^2 = 2.3 \cdot 10^{-3} \text{ eV}^2$ . These results have been published in many papers of international resonance: one famous paper, according to the SPIRES database, cited 422 times (Ref.A6) [51]) and two best known papers are very much based on my PhD Thesis (Ref.A6) [42] and [58]). I also was one of the two authors of the final paper on the atmospheric neutrino analysis (Ref. A)[26]).

In the MACRO experiment I have also been responsible for the development of the analyses for astrophysical neutrinos and for dark matter particles. I was the corresponding author of the journal papers where the analyses were published (Ref. A)[41] and [46], respectively).

Many papers on neutrino measurement in MACRO could have not been written without my contribution (Ref. A5) [30, 31, 36, 43, 50, 51]).

### **NEMO experiment**

In 1999 I developed with S. Bottai of the University of Florence a full simulation of signal and detector response for the proposal and first performance studies of the proposed  $\text{km}^3$  neutrino telescope in the Mediterranean (see Ref. C)[37] of Conference Proceedings). These early estimates were used for obtaining the initial funding of this R&D NEMO program.

### **Other activities**

I am part of the 3.5m WIYN TAC since 2006, that allocates telescope observation times to groups belonging to the University of Wisconsin. WIYN is a 3.5m and a 0.9m telescope at Kitt Peak in Arizona. I have started a program with the WIYN 0.9 m telescope and VERITAS to analyze optical and TeV observations of Mrk 421, Mrk 501 and 1ES 1959+650 and other blazars to look for signals in coincidence between an optical telescope, an Imaging Cherenkov Telescope array and IceCube neutrino telescope. This program is ongoing since Spring 2006. The optical analysis are going to be published in a multi-wavelength paper in preparation with the VERITAS Collaboration (see A5)[25] and Ref. C) [7,8]), that approved my associate membership.

I have supported proposals of experiments of hadroproduction at Fermilab (MIPP, Ref. B1)[2]) and at CERN (NA49, Ref. B1)[1]) for future analysis that could be of interest for cosmic ray experiments. MIPP can measure multi-particle hadronic production using 6 beam species ( $\pi^\pm$ ,  $K^\pm$ ,  $p^\pm$ ) in the momentum range from 1-120 GeV/c. The run on some nuclei that are abundant in our atmosphere (e.g.  $N_2$ ) will allow to benchmark atmospheric shower calculations widely used in the Cosmic Ray community. Similarly, NA49 foresees to take data with proton and pion beams starting from 2007 and with beams of nuclei from 2009 until 2011. Important runs will be proton-C at 20, 100, 250, 400 GeV/c and  $\pi^\pm - C$  at 30, 250 GeV. These measurements of hadron production in hadron - nucleus collisions are needed for neutrino (eg. T2K, MINOS) and cosmic ray experiments (eg. IceCube, Pierre Auger Observatory

and KASCADE).

In collaboration with Dr. P. Lipari I developed a Monte Carlo to study the performances of a satellite experiment looking downwards to the fluorescence light emitted by charged particles in the atmosphere (see Ref. C)[43] of Conference Proceedings). This experiment was originally named Airwatch and is now named EUSO.

### **Impact of Publications in the International Scientific Community**

From SPIRES database (<http://www.slac.stanford.edu/spires> and a search there <http://www.slac.stanford.edu/spires/find/hep/www?rawcmd=FINN+a+Montaruli&FORMAT=wwwcitesummary&SEQUENCE=>): 166papers (of which 128 are defined eligible papers published or arXiv E-prints)

Famous papers: 1 (cited 438 times) Ref. A)[51] in this list

Very well known papers: 6 (cited 215, 121, 113, 121, 111, 104 times, respectively Refs. A)[42], Ref. A)[43], A)[58] and A)[71] in this list.

8 well known papers (cited between 50-99 times) Refs. A)[12],[26], [30], [39], [41], [46], [60] and [69] in this list, 10 known published papers (cited between 10-49 times).

Total number of citations of published papers: 3310.

## **Publications in Refereed Journals**

### **A1) Review Papers**

- [1 ] W. Bednarek, F. Burgio and T. Montaruli, *Galactic discrete sources of high energy neutrinos*, New Astron. Rev. **49** (2005) 1-21.

### **A2) IceCube Experiment**

- [2 ] R. Abbasi *et al.*, *Search for High-Energy Muon Neutrinos from the “Naked-Eye” GRB 080319B with the IceCube Neutrino Telescope*, Astrop. J. **701** (2009) 1721-1731.
- [3 ] R. Abbasi *et al.*, *First Neutrino Point-Source Results From the 22-String IceCube Detector*, Astrop. J. L **701** (2009) L47-L51.
- [4 ] R. Abbasi *et al.*, *Search for Point Sources of High Energy Neutrinos with Final Data from AMANDA-II*, Phys. Rev. D **79** (2009) 062001.
- [5 ] R. Abbasi *et al.*, The IceCube Collaboration, *Determination of the Atmospheric Neutrino Flux and Searches for New Physics with AMANDA-II*, Phys. Rev. D **79** (2009) 102005.
- [6 ] R. Abbasi *et al.*, The IceCube Collaboration, *Limits on a muon flux from neutralino annihilations in the Sun with the IceCube 22-string detector*, Phys. Rev. Lett. **102** (2009) 201302.
- [7 ] R. Abbasi *et al.*, The IceCube Collaboration, *The IceCube Data Acquisition System: Signal Capture, Digitization, and Timestamping*, Nuclear Inst. and Methods in Physics Research, A **601** (2009), pp. 294-316, and

arXiv:0810.4930.

- [8 ] R. Abbasi *et al.*, The IceCube Collaboration, *Solar Energetic Particle Spectrum on 13 December 2006 Determined by IceTop*, accepted by the *Astrop. J. Lett.*
- [9 ] A. Achterberg *et al.*, The IceCube Collaboration, *The Search for Muon Neutrinos from Northern Hemisphere Gamma-Ray Bursts with AMANDA*, *Astrophys. J.* **674** (2008) 357-370.
- [10 ] A. Achterberg *et al.*, The IceCube Collaboration, *Search for Ultra High-Energy Neutrinos with AMANDA-II*, *Astrophys. J.* **675** (2008) 1014.
- [11 ] A. Achterberg *et al.*, The IceCube Collaboration, *Multiyear search for a diffuse flux of muon neutrinos with AMANDA-II*, *Phys. Rev.* **D76** (2007) 042008.
- [12 ] A. Achterberg *et al.*, The IceCube Collaboration, *Search for neutrino-induced cascades from gamma-ray bursts with AMANDA*, *Astrophys. J.* **664** (2007) 397-410.
- [13 ] A. Achterberg *et al.*, The IceCube Collaboration, *Limits on the muon flux from neutralino annihilations at the center of the Earth with AMANDA*, *Astropart. Phys.* **26** (2006) 129-139.
- [14 ] A. Achterberg *et al.*, The IceCube Collaboration, *Five years of searches for point sources of astrophysical neutrinos with the AMANDA-II neutrino telescope*, *Phys. Rev.* D75 (2007) 102001, eprint: astro-ph/0611063 (2006).
- [15 ] A. Achterberg *et al.*, The IceCube Collaboration, *Limits on the high-energy gamma and neutrino fluxes from the SGR 1806-20 giant flare of December 27th, 2004 with the AMANDA-II detector*, *Phys. Rev. Lett.* **97** (2006) 221101, eprint: astro-ph/0607233.
- [16 ] A. Achterberg *et al.*, The IceCube Collaboration, *First Year Performance of The IceCube Neutrino Telescope*, *Astrop. Phys.* **26** (2006) 155-173, eprint: astro-ph/0604450 (**TopCite = 50+**, **cited 52 times**).
- [17 ] A. Achterberg *et al.*, The IceCube Collaboration, *On the selection of AGN neutrino source candidates for a source stacking analysis with neutrino telescopes*, *Astrop. Physics* **26** (2006) 282-300, (**internal referee in the collaboration**), eprint: astro-ph/0609534.
- [18 ] A. Achterberg *et al.*, The IceCube Collaboration, *Detection of atmospheric muon neutrinos with the IceCube 9-string detector*, *Phys. Rev.* **D76** (2007) 027101.

### A3) ANTARES Experiment

- [19 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *Performance of the first ANTARES detector line*, accepted by *Asrop. Phys., ASTROPARTPHYS-D-08-00157R1* (2009).
- [20 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *The ANTARES Op-*

*tical Beacon system*, Nucl. Instr. & Meth. **A 578/3** (2007) 498-509.

- [21 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *Studies of a full scale mechanical prototype line for the ANTARES neutrino telescope and tests of a prototype instrument for deep-sea acoustic measurements*, NIM **A581** (2007) 695-708.
- [22 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *The data acquisition system for the ANTARES neutrino telescope*, Nucl. Instr. & Meth. **A570** (2007) 107-116 and eprint: astro-ph/0610029 (2006).
- [23 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *First results of the Instrumentation Line for the deep-sea ANTARES neutrino telescope*, Astrop. Phys. **26** (2006) 314-324.
- [24 ] J.A. Aguilar *et al.*, The ANTARES Collaboration, *Study of large hemispherical photomultiplier tubes for the ANTARES neutrino telescope*, Nucl. Instr. Meth. **A555** (2005) 132-141, eprint: physics/0510031.
- [25 ] J.A. Aguilar *et al.* The ANTARES Collaboration, *Transmission of light in deep sea water at the site of the ANTARES Neutrino Telescope*, Astrop. Phys. **23** (2005) 131-155, eprint: astro-ph/0412126.
- [26 ] P. Amram *et al.*, *Sedimentation and fouling of optical surfaces at the ANTARES site*, Astrop. Phys. **19** (2003) 253-267.
- [27 ] P. Amram *et al.*, *The ANTARES optical modules*, Nucl. Instrum. & Meth. **A484** (2002) 369-383.

#### **A4) NEMO Experiment**

- [28 ] S. Aiello *et al.*, The NEMO Collaboration, *Sensitivity of an underwater Cerenkov km<sup>3</sup> telescope to TeV neutrinos from Galactic Microquasars*, Astropart. Phys. **28** (2007) 1-9. e-Print: astro-ph/0608053
- [29 ] G. Riccobene *et al.*, *Deep seawater inherent optical properties in the Southern Ionian Sea*, Astrop. Phys **27** (2007) 1-9

#### **A5) VERITAS and WIYN Experiments**

- [30 ] D. Horan *et al.*, *Multiwavelength Observations of Mrk 421 in 2005-2006*, Astrophys. J. **695** (2009) 596-618.

#### **A6) MACRO Experiment**

- [31 ] M. Ambrosio *et al.*, The MACRO Collaboration, *Measurement of Atmospheric Muon Neutrino Oscillations, Global Analysis of the Data Collected with MACRO Detector*, Eur. Phys. J **C36** (2004) 323-339 (**corresponding author**), (**TopCite = 50+**, **cited 85 times**).
- [32 ] M. Ambrosio *et al.*, The MACRO Collaboration, *Search for stellar gravitational collapses with the MACRO detector*, Eur. Phys. J. **C37** (2004) 265-272.

- [33 ] M. Aglietta *et al.*, EAS-TOP and MACRO Collaborations, *The cosmic ray proton, helium and CNO fluxes in the 100-TeV energy region from TeV muons and EAS atmospheric Cherenkov light observations of MACRO and EAS-TOP*, *Astrop. Phys.* **21** (2004) 223-240.
- [34 ] M. Aglietta *et al.*, EAS-TOP Collaboration and MACRO Collaboration, *The primary cosmic ray composition between  $10^{15}$  and  $10^{16}$  eV from extensive air shower electromagnetic and TeV muon data*, *Astropart. Phys.* **20** (2004) 641-652.
- [35 ] M. Ambrosio *et al.*, *Atmospheric neutrino oscillations from upward through-going muon multiple scattering in MACRO*, *Phys. Lett.* **B566** (2003) 35-44 (**TopCite = 50+**, **cited 99 times**).
- [36 ] M. Ambrosio *et al.*, *Search for diffuse neutrino flux from astrophysical sources with MACRO*, *Astrop. Phys.* **19** (2003) 1-13.
- [37 ] M. Ambrosio *et al.*, *Moon and Sun shadowing effect in the MACRO detector*, *Astrop. Phys.* **20** (2003) 145-156.
- [38 ] M. Ambrosio *et al.*, *Measurement of the residual energy of muons in the Gran Sasso underground laboratories*, *Astrop. Phys.* **19** (2003) 313-328.
- [39 ] M. Ambrosio *et al.*, *Search for cosmic ray sources using muons detected by the MACRO experiment*, *Astrop. Phys.* **18** (2003) 615-627.
- [40 ] M. Ambrosio *et al.*, *The search for the sidereal and solar diurnal modulations in the total MACRO muon data set*, *Phys. Rev.* **D67** 042002 (2003).
- [41 ] M. Ambrosio *et al.*, *Muon energy estimate through multiple scattering with the MACRO detector*, *Nucl. Instrum. & Meth.* **A 492** (2002) 376-386.
- [42 ] M. Ambrosio *et al.*, *A combined analysis technique for the search for fast magnetic monopoles with the MACRO detector*, *Astrop. Phys.* **18** (2002) 27-41.
- [43 ] M. Ambrosio *et al.*, *Search for nucleon decays induced by GUT magnetic monopoles with the MACRO experiment*, *Eur. Phys. J.* **C26** (2002) 163-172.
- [44 ] M. Ambrosio *et al.*, *Final results of magnetic monopole searches with the MACRO experiment*, *Eur. Phys. J.* **C 25** (2002) 511-522, (**TopCite = 50+**, **cited 61 times**).
- [45 ] M. Ambrosio *et al.*, *The MACRO detector at Gran Sasso*, *Nucl. Instrum. & Meth.* **A486** (2002) 663-707.
- [46 ] M. Ambrosio *et al.*, *Neutrino astronomy with the MACRO detector*, *Astrophys. J.* **546** (2001) 1038-1054 (**corresponding author, Top-cite=50+**, **cited 66 times**).
- [47 ] M. Ambrosio *et al.*, *Matter effects in upward going muons and sterile neutrino oscillations*, *Phys. Lett.* **B517** (2001) 59 (**Top-cite=100+**, **cited 202 times**).

- [48 ] M. Ambrosio *et al.*, *Low-energy atmospheric muon neutrinos in MACRO*, Phys. Lett. **B478** (2000) 5-13 (**Top-cite=100+**, **cited 114 times**).
- [49 ] M. Ambrosio *et al.*, *A search for lightly ionizing particles with the MACRO detector*, Phys. Rev. **D62** (2000) 052003.
- [50 ] M. Ambrosio *et al.*, *Nuclearite search with the MACRO detector at Gran Sasso*, Eur. Phys. J. **C 13** (2000) 453-458.
- [51 ] M. Ambrosio *et al.*, *Limits on dark matter WIMPs using upward-going muons in the MACRO detector*, Phys. Rev. **D 60** (1999) 82002, 1-10 (**corresponding author, TopCite 50+**, **cited 78 times**).
- [52 ] M. Ambrosio *et al.*, *High statistics measurement of the underground muon pair separation at Gran Sasso*, Phys. Rev. **D60** (1999) 032001, 1-13.
- [53 ] M. Ambrosio *et al.*, *Measurement of the energy spectrum of underground muons at Gran Sasso with a transition radiation detector*, Astrop. Phys **10** (1999) 11-20.
- [54 ] M. Ambrosio *et al.*, *Observation of the shadowing of cosmic rays by the Moon using a deep underground detector*, Phys. Rev. **D59** (1999) 012003, 1-7.
- [55 ] M. Ambrosio *et al.*, *The observation of up-going charged particles produced by high energy muons in underground detectors*, Astrop. Phys. **9** (1998) 105-117.
- [56 ] M. Ambrosio *et al.*, *Measurement of the atmospheric neutrino induced upgoing muon flux using MACRO*, Phys. Lett. **B434** (1998) 451-457 (**Top-cite=250+**, **cited 422 times**).
- [57 ] M. Ambrosio *et al.*, *Real time supernova neutrino burst detection with MACRO*, Astrop. Phys. **8** (1998) 123-133.
- [58 ] M. Ambrosio *et al.*, *High energy cosmic ray physics with underground muons in MACRO. I. Analysis methods and experimental results*, Phys. Rev. **D 56** (1997) 1407-1417.
- [59 ] M. Ambrosio *et al.*, *High energy cosmic ray physics with underground muons in MACRO. II. Primary spectra and composition*, Phys. Rev. **D 56** (1997) 1418-1436.
- [60 ] M. Ambrosio *et al.*, *Magnetic monopole search with the MACRO detector at Gran Sasso*, Phys. Lett. **B 406** (1997) 249-255.
- [61 ] M. Ambrosio *et al.*, *Seasonal variations in the underground muon intensity as seen by MACRO*, Astrop. Phys. **7** (1997) 109-124.
- [62 ] M. Ambrosio *et al.*, *The performance of MACRO liquid scintillator in the search for magnetic monopoles with  $10^{-3} < \beta < 1$* , Astrop. Phys. **6** (1997) 113-128.
- [63 ] S. Ahlen *et al.*, *Atmospheric neutrino flux measurement using upgoing muons*, Phys. Lett. **B 357** (1995) 481-486 (**Top-cite=100+**, **cited 115 times**).

- [64 ] M. Ambrosio *et al.*, *Performance of the MACRO streamer tube system in the search for magnetic monopoles*, *Astrop. Phys.* **4** (1995) 33-43.
- [65 ] M. Ambrosio *et al.*, *Vertical muon intensity measured with MACRO at the Gran Sasso laboratory*, *Phys. Rev D* **52** (1995) 3793-3802, (**TopCite = 50+**, **cited 73 times**).
- [66 ] M. Aglietta *et al.*, *EAS-TOP Collaboration and MACRO Collaboration, Study of the primary cosmic ray composition around the knee of the energy spectrum*, *Phys. Lett. B* **337** (1994) 376-382.

#### A7) Papers with few authors

- [67 ] J. Braun, F. J. Dumm, F. De Palma, C. Finley, A. Karle, T. Montaruli, *Methods for point source analysis in high energy neutrino telescopes*, *Astropart. Phys.* **29** (2008) 299 and arXiv:0801.1604 (2008).
- [68 ] P. Berghaus, T. Montaruli and J. Ranft, *Charm production in DPM-JET*, *JCAP06* (2008) 003, and arXiv:0712.3089
- [69 ] L. Anchordoqui, F. Halzen, T. Montaruli, A. O'Murchadha, *Neutrino Flux from Cosmic Ray Accelerators in the Cygnus Spiral Arm of the Galaxy*, *Phys. Rev. D* **76** (2007) 067301.
- [70 ] M. Cirelli, N. Fornengo, T. Montaruli, I. Sokalski, A. Strumia, *Spectra of Neutrinos from Dark Matter Annihilations*, *Nucl. Phys.* **B727** (2005), 99-138, eprint: hep-ph/0506298.
- [71 ] G. Battistoni, A. Ferrari, T. Montaruli and P.R. Sala, *The atmospheric neutrino flux below 100 MeV calculation: the FLUKA results*, *Astrop. Phys.* **23** (2005) 526-534.
- [72 ] A. L'Abbate, T. Montaruli, I. Sokalski, *Effect of neutral current interactions on high energy muon and electron neutrino propagation through the Earth*, *Astrop. Phys.* **23** (2005) 57-63, eprint: hep-ph/0406133.
- [73 ] E. Bugaev, T. Montaruli, Y. Shlepin and I. Sokalski, *Propagation of tau neutrinos and tau leptons through the Earth and their detection in underwater/ice neutrino telescopes*, *Astrop. Phys.* **21** (2004) 491-509.
- [74 ] G. Battistoni, A. Ferrari, T. Montaruli and P.R. Sala, *The FLUKA atmospheric neutrino flux calculation*, *Astrop. Phys.* **19** (2003) 269-290, Erratum-ibid. **19** (2003) 291-294, (**TopCite = 50+**, **cited 65 times**)
- [75 ] G. Battistoni, A. Ferrari, T. Montaruli and P. R. Sala, *Comparison of the FLUKA calculation with CAPRICE94 data on muons in atmosphere*, *Astrop. Phys.* **17** (2002) 477-488.
- [76 ] G. Battistoni, A. Ferrari, P. Lipari, T. Montaruli, P. R. Sala and T. Rancati, *A 3-Dimensional Calculation of Atmospheric Neutrino Flux*, *Astrop. Phys.* **12** (2000) 315-333 (**Top-cite=100+**, **cited 115 times**).
- [77 ] M. Ambriola, R. Bellotti, F. Cafagna, M. Castellano, F. Ciaccio, M. Circella, C.N. De Marzo and T. Montaruli, *Cosmic-ray discrimination capabilities of  $\Delta E - E$  silicon nuclear telescopes using neural networks*,

Nucl. Instr. & Meth. in Phys. Res. **A 440** (2000) 438-445.

- [78 ] E. Barbarito et al., *A large area transition radiation detector to measure the energy of muons in the Gran Sasso underground laboratory*, Nucl. Instr. & Meth. in Phys. Res. **A 365** (1995) 214-223.

## B) Papers in special journal series or in public databases

### B1) Proposals of Experiments

- [1 ] N. Antoniou et al., The NA49 Collaboration, *Study of hadron production in hadron nucleus and nucleus nucleus collisions at the CERN SPS*, CERN-SPSC-2006-034 (2006).
- [2 ] D. Isenhower et al., The MIPP Collaboration, *Proposal to upgrade the MIPP experiment*, eprint: hep-ex/0609057 (2006).

### B2) Models and Calculations

- [3 ] F. Halzen, H. Landsman, T. Montaruli, *TeV Photons and Neutrinos from giant soft-gamma repeater flares*, astro-ph/0503348 (2005), final paper in preparation.
- [4 ] F. A. Aharonian, L. Anchordoqui, D. Khangulyan and T. Montaruli, *LS 5039 a potential TeV neutrino source*, J. Phys. Conf. Ser. **39** (2006) 408, eprint: astro-ph/0508658.

## C) Conference Proceedings

- [1 ] T. Montaruli for the ANTARES Collaboration, *The ANTARES underwater neutrino telescope*, Proc. of 7<sup>th</sup> Alexander Friedmann International Seminar on Gravitation and Cosmology, to appear in Int. Journal of Modern Physics A (2008).
- [2 ] T. Montaruli for the IceCube Collaboration, *First Results of the IceCube Observatory on High Energy Neutrino Astronomy*, Journal of Physics (Conf. Series) **120** (2008) 062009.
- [3 ] J. Braun, A. Karle, T. Montaruli, for the IceCube Collaboration, *Neutrino point source search strategies for AMANDA-II and results from 2005*, 30<sup>th</sup> Int. Cosmic Ray Conf., ICRC 2007, Merida, Mexico, Jul. 2007, e-print arXiv:0711.0353, pag 99-102.
- [4 ] C. Finley, J. Dumm and T. Montaruli for the IceCube Collaboration, *Nine-string IceCube point source analysis*, 30<sup>th</sup> Int. Cosmic Ray Conf., ICRC 2007, Merida, Mexico, Jul. 2007, e-print arXiv:0711.0353, pag. 107-110
- [5 ] T. Montaruli, *Review on Neutrino Telescopes*, Nucl. Phys. **B** (Proc. Suppl.) **165** (2006) 161-171, Proc. of CRIS 2006 - Cosmic Ray International Seminar (2006).

- [6 ] T. Montaruli for the iceCube Collaboration, *IceCube: The state of the art*, to appear in Proc. of Vulcano Workshop 2006: Frontier Objects in Astrophysics and Particle Physics, Vulcano, Italy, 22-27 May 2006, sub. to Italian Phys.Soc.Proc., e-Print Archive: astro-ph/0608140.
- [7 ] M. Bayer, J. Dumm, K. Larson and T. Montaruli, *Joint multi-wavelength observations of blazars with WIYN-VERITAS-IceCube*, J. Phys. Conf. Ser. **60** (2007) 300-302, Proc. of 2<sup>nd</sup> TeV Particle Astrophysics Conference, Madison, Wisconsin, 28-31 Aug. 2006.
- [8 ] D. Steele *et al.*, *Results from the Blazar Monitoring Campaign at the Whipple 10m Gamma-ray Telescope*, Proc. of ICRC2007, Merida, Mexico, Jul. 2007 and arXiv:0709.3869.
- [9 ] G. Battistoni, R. Ganugapati, A. Karle, J.L. Kelley and T. Montaruli, *Comparison of high energy interaction models used for atmospheric shower simulations above 1 TeV*, J. Phys. Conf. Ser. **60** (2007 )330-333, Proc. of 2<sup>nd</sup> TeV Particle Astrophysics Conference, Madison, Wisconsin, 28-31 Aug. 2006.
- [10 ]T. Montaruli for the ANTARES Collaboration, *The ANTARES Neutrino Telescope: exploring the universe from the sea abyss*, AIP Conf. Proc. **842** (2006) 865-867, Proceedings of PANIC2005, Santa Fe, NM, Oct. 2005.
- [11 ] T. Montaruli, *High Energy Neutrino Astrophysics*, Nucl. Phys. (Proc. Suppl.) **138** (2005) 502-509, Proc. of 8<sup>th</sup> Int. Workshop on Topics in Astroparticle and Underground Physics (TAUP 2003), 5-9 Sep. 2003, Seattle (WA).
- [12 ] A. Masiero and T. Montaruli, *Summary of Session 'Atlas Coelestis Neutrinos from heavens*, Nucl. Phys. (Proc. Suppl.) **145** (2005), 128-131, Proc. of Neutrino Oscillation Workshop (NOW2004), Otranto, Italy, Sep. 2004.
- [13 ] A. Achterberg *et al.*, The IceCube Collaboration, *The IceCube Collaboration: contributions to the Int. Cosmic Ray Conference (ICRC2005)*, Proceedings of the 29<sup>th</sup> Int. Cosmic Ray Conf. (ICRC2005), Pune, India, Aug. 2005 and astro-ph/0509330.
- [14 ] T. Montaruli, *Neutrino Astrophysics and Telescopes*, Eur. Phys. J. **A24S1** (2005) 103, Proc. of 8<sup>th</sup> Workshop on Electron Nucleus Scattering, Isola d'Elba, Italy, Jun 2004.
- [15 ] T. Montaruli, *Neutrino Astronomy with ANTARES*, Acta Phys. Polon. **B36** (2005) 509-518, Proc. of 34<sup>th</sup> Int. Symposium on Multiparticle Dynamics (ISMD 2004), Rohnert Park, California, 26 Jul - 1 Aug 2004, eprint: hep-ex/0410079.
- [16 ] G. Battistoni, A. Ferrari, T. Montaruli, P.R. Sala, *The atmospheric neutrino fluxes below 100-MeV: The FLUKA results*, Nucl. Phys. Proc. Suppl. **145** (2005) 128, Proc. of . Proc. of Neutrino Oscillation Workshop (NOW2004), Otranto, Italy, Sep. 2004.

- [17 ] E. Bugaev, T. Montaruli, I. Sokalski, *Astrophysical tau neutrinos and their detection by large neutrino telescopes*, Phys. Atom. Nucl. **67** (2004) 1177-1181.
- [18 ] T. Montaruli, *Report on the High-Energy Phenomena Sessions HE 2, HE 3.2-3.4: Neutrinos and Muons. Interactions, Particle Physics Aspects, Astroparticle Physics and Cosmology*, Invited/Highlights/Rapporteur Proc. of 28<sup>th</sup> Int. Cosmic Ray Conf. (ICRC2003), 31 Jul. -7 Aug. 2003, Tsukuba, Japan.
- [19 ] T. Montaruli, *Astrophysics Neutrino Detection*, Proc. of XV IFAE, Società Italiana di Fisica, Workshop on High Energy Physics, Lecce (Italy), 23-26 Apr. 2003.
- [20 ] T. Montaruli for the ANTARES Collaboration, *ANTARES Status Report*, Proc. of 28<sup>th</sup> Int. Cosmic Ray Conf. (ICRC2003), 31 Jul.-7 Aug. 2003, Tsukuba, Japan, pp. 1357-1360.
- [21 ] E. Bugaev, T. Montaruli, I. Sokalski, *Detection of tau neutrinos in underwater neutrino telescopes*, Proc. of 28<sup>th</sup> Int. Cosmic Ray Conf. (ICRC2003), 31 Jul.-7 Aug. 2003, Tsukuba, Japan, pp. 1381-1384.
- [22 ] G. Battistoni, A. Ferrari, T. Montaruli, P. R. Sala, *High energy extension of the FLUKA atmospheric neutrino flux*, Proc. of 28<sup>th</sup> Int. Cosmic Ray Conf. (ICRC2003), 31 Jul.-7 Aug. 2003, Tsukuba, Japan, pp. 1399-1402.
- [23 ] T. Montaruli for the ANTARES Collaboration, *The ANTARES project*, 31<sup>th</sup> Int. Conf. on High Energy Physics (ICHEP2002), Amsterdam, The Netherlands, 24-31 July 2002 and astro-ph/0207531.
- [24 ] T. Montaruli for the ANTARES Collaboration, *The ANTARES project*, Proc. of SPIE, Astronomical Telescopes and Instrumentation, 22-28 Aug. 2002, Waikoloa, Hawaii.
- [25 ] T. Montaruli for the ANTARES Collaboration, *Status report of the ANTARES Project*, Proc. of TAUP 2001, Laboratori Nazionali del Gran Sasso, Sep. 8-12, 2001, Nucl. Phys. **B** (Proc. Suppl.) **110** (2002) 513-515.
- [26 ] G. Battistoni, A. Ferrari, T. Montaruli and P.R. Sala, *Progresses in the validation of the FLUKA atmospheric neutrino flux calculation*, Nucl. Phys. **B** (Proc. Suppl.) **110** (2002) 336-338, Proc. of TAUP 2001, Laboratori Nazionali del Gran Sasso, 8-12 Sep. 2001.
- [27 ] T. Montaruli, *High energy neutrino astronomy and WIMP search results*, Proceeding of Int. Conf. "From Astronomy to Particle Physics", Oujda, Morocco, 21-23 Mar. 2000, in Cosmic Radiations: From Astronomy to Particle Physics, ed. G. Giacomelli et al., NATO Science Series, pp. 187-198 (2001).
- [28 ] T. Montaruli, *Women in physics*, Proc. of Int. Conf. "From Astronomy to Particle Physics", Oujda, Morocco, 21-23 Mar. 2000, pubblicato in Cosmic Radiations: From Astronomy to Particle Physics, ed. G. Giacomelli et al., NATO Science Series, pp. 344-348 (2001).

- [29 ] T. Montaruli for the MACRO Collaboration, *Results on high-energy atmospheric neutrino oscillations with MACRO*, in Proc. of 27<sup>th</sup> Int. Cosmic Ray Conf., Hamburg, Germany, Aug. 2001, HE2.03, available at <http://www.copernicus.org/icrc/HE2.03.oral.htm>
- [30 ] T. Montaruli for the MACRO Collaboration, *Neutrino Astronomy and Indirect Search for WIMPs*, in Proc. of 3<sup>rd</sup> Int. Conf. on Dark Matter in Astro- and Particle Physics: Dark 2000, Heidelberg, Germany, 10-16 July 2000, 688-698 (2000).
- [31 ] T. Montaruli, *High Energy Neutrino Astrophysics*, LXXXVI National Congress of Società Italiana di Fisica, Palermo, 6-11 Oct. 2000, p. 35 (2000).
- [32 ] T. Montaruli and F. Ronga for the MACRO Collaboration, *Search for a possible space-time correlation between high energy neutrinos and  $\gamma$ -ray bursts*, Proc. of "Rome'98 gamma-ray burst workshop", Astron. Astrophys. Suppl. Ser. **142** (2000) 1.
- [33 ] T. Montaruli, F. Cei, R. Pazzi and F. Ronga, for the MACRO Collaboration, *Neutrino Astrophysics with the MACRO detector*, Proc. of "Gamma-Ray Bursts in the Afterglow Era: 2nd Workshop", Roma, 17-20 Oct. 2000, in Springer-Verlag series "ESO Astrophysics Symposia".
- [34 ] T. Montaruli for the MACRO Collaboration, *The detection of Neutrinos, Monopoles and Indirect Search for WIMPs in the MACRO detector* Proc. of the 2<sup>nd</sup> Int. Conf. "Beyond the Desert '99 - Accelerator, Non-Accelerator and Space approaches into the Next Millenium", Castle Ringberg, Germany, 6-12 giugno 1999, ed. Institute of Physics, Bristol, 899-913 (1999).
- [35 ] T. Montaruli for the MACRO Collaboration, *Search for WIMPs using upward-going muons in MACRO*, Proc. of 26<sup>th</sup> Int. Cosmic Ray Conf. (ICRC 99), Salt Lake City, Utah, 17-25 Aug. 1999, HE Session 5.1, vol. **2** (1999) 277.
- [36 ] T. Montaruli for the MACRO Collaboration, *MACRO as a telescope for neutrino astronomy*, Proc. of 26<sup>th</sup> Int. Cosmic Ray Conf. (ICRC 99), Salt Lake City, Utah, 17-25 Aug. 1999, HE Session 4.2, vol. **2** (1999) 213.
- [37 ] T. Montaruli for the NEMO collaboration, *Capabilities of an underwater detector as a neutrino telescope and for the neutrino oscillation search*, Proc. of 26<sup>th</sup> Int. Cosmic Ray Conference (ICRC 99), Salt Lake City, Utah, 17-25 Aug. 1999 HE Session 6.3, vol. **2** (1999) 448.
- [38 ] T. Montaruli for the MACRO Collaboration, *The measurement of upward going muons using the MACRO detector*, Nucl. Phys. **B** (Proc. Suppl.) **70** (1999) 367-370, Proc. of TAUP 97, Laboratori Nazionali del Gran Sasso, 7-11 Sep. 1997.
- [39 ] G. Battistoni, C. Bloise, D. Cavalli, A. Ferrari, T. Montaruli, T. Rancati, S. Resconi, F. Ronga, P.R. Sala, *A new calculation of atmospheric neutrino flux: the FLUKA approach*, Nucl. Phys. **B** (Proc. Suppl.) **70**

- (1999) 358-360, Proc. of TAUP 97, Laboratori Nazionali del Gran Sasso, 7-11 Sep. 1997.
- [40 ] T. Montaruli for the MACRO Collaboration, *Atmospheric and Astrophysics Neutrinos with MACRO*, 2<sup>nd</sup> Int. Conf. on Dark Matter in Astro- and Particle Physics: Dark Matter '98 Heidelberg, Germany; 20 - 25 Jul. 1998, ed. H. V. Klapdor-Kleingrothaus and L. Baudis, 790-804 (1998).
- [41 ] T. Montaruli for the MACRO Collaboration, *Atmospheric neutrinos with MACRO*, Proc. of Int. School of Subnuclear Physics "36<sup>th</sup> Course: from the Planck Length to the Hubble Radius", Centro Ettore Majorana, Erice, 29 Aug.-7 Sep. 1998, ed. A. Zichichi, World Scientific, 633-642.
- [42 ] T. Montaruli for the MACRO Collaboration, *Muon neutrinos with the MACRO detector at L.N.G.S.*, Proc. of the Erice School on Nucl. Physics, 19<sup>th</sup> Course "Neutrinos in Astro, Particle and Nuclear Physics", 16-24 Sep. 1997, Progr. Part. and Nucl. Phys. **40** (1998) 249-250, ed. by A. Faessler.
- [43 ] T. Montaruli, R. Bellotti, F. Cafagna, M. Circella, C.N. De Marzo, P. Lipari, *A simulation code to assist designing space missions of the Air-watch type*, 43<sup>rd</sup> SPIE Int. Symposium on Optical Science, Engineering, and Instrumentation : Hard X-ray and Gamma-ray Detector Physics and Applications San Diego, CA, USA; 19 - 24 Jul 1998, publ. in Proc. SPIE, 3446 qnd hep-ex/9810014.
- [44 ] T. Montaruli for the MACRO Collaboration, *Upward-going muons and WIMPs in the MACRO detector*, Proc. of DM97, 1<sup>st</sup> Italian Conf. on Dark Matter, Trieste, Dec. 9-11, 1997, pp. 52-61, ed. Paolo Salucci, Studio Editoriale Fiorentino (1997).
- [45 ] T. Montaruli for the MACRO Collaboration, *Indirect Search for WIMPs with the MACRO detector*, Proc. of the 25<sup>th</sup> Int. Cosmic Ray Conf., Durban, South Africa, 28 Jul.-10 Aug. 1997, Vol. **7**, HE Sessions 4-6, 185-188.
- [46 ] T. Montaruli for the MACRO Collaboration, *Neutrino induced upward-going muons and WIMP search in the MACRO experiment*, in Dark Matter in Astro- and particle physics DARK '96, Heidelberg, Germany, 16 - 20 Sep. 1996, ed. H. V. Klapdor-Kleingrothaus & Y. Ramachers, pp. 695-703 (1996).
- [47 ] T. Montaruli for the MACRO Collaboration, *Search for neutrinos from the Sun and the Earth with the MACRO detector*, Nucl. Phys. B (Proc. Suppl.) **48** (1996) 87-90, Proc. of TAUP 95, Toledo, Spain, 17-21 Sep. 1995.
- [48 ] T. Montaruli for the MACRO Collaboration, *Neutrino induced upgoing muons in MACRO*, Proceedings of Eighth "Rencontres de Blois", Chateau de Blois, France, Jun. 8-12, 1996, in "Neutrinos, Dark Matter and the Universe", ed. by T. Stolarczyk, J. Trân Thanh Vân, F. Vannucci, 299-300 (1996).

## D) Internal Notes of Experiments

### MACRO:

- [1 ] T. Montaruli, B. Pavese, F. Ronga, *Upgoing muons in the 6 month run*, MACRO Internal Note 4/94 (1994)
- [2 ] T. Montaruli and F. Ronga, *MACRO limits on WIMPs from Sun and Earth*, MACRO Internal Note 31/94 (1994)
- [3 ] T. Montaruli and F. Ronga, *Neutrino induced upgoing muon analysis on attico data*, MACRO Internal Note 3/96 (1996)
- [4 ] T. Montaruli, *MACRO experimental limits on WIMP's from the Sun and the Earth*, MACRO Internal Note 9/96 (1996)
- [5 ] T. Montaruli and F. Ronga, *Investigation on upgoing-muon analysis*, MACRO Internal Note 2/97 (1997).
- [6 ] T. Montaruli, F. Ronga and A. Surdo, *Further checks on the systematic in the upgoing-muon analysis*, MACRO Internal Note 13/97 (1997).
- [7 ] T. Montaruli and F. Ronga, *Throughgoing upgoing-muon events*, MACRO Internal Note 1/98 (1998).
- [8 ] T. Montaruli and F. Ronga, *Throughgoing upgoing-muon events after calibrations and new data*, MACRO Internal Note 12/98 (1998).
- [9 ] T. Montaruli and F. Ronga, *Neutrino astronomy with the MACRO detector*, MACRO Internal Note 13/98 (1998).
- [10 ] T. Montaruli, *Limits on dark matter WIMP particles using upward-going muons in the MACRO detector*, MACRO Internal Note 15/98 (1998).

### ANTARES:

- [11 ] A. Balenzano, F. Burgio and T. Montaruli, *Review of models of galactic sources and rate estimates in ANTARES: young supernova remnants, plerions, magnetars and micro-quasars*, ANTARES-Phys/2003-006.
- [12 ] K. Kuzmin, T. Montaruli, I. Sokalski, *GENHEN v6r3: implementation of the Glashow resonance and of MUSIC transport code*, ANTARES-Soft/2004-012.
- [13 ] A. L'Abbate, T. Montaruli and I. Sokalski, *GENHEN v6: ANTARES neutrino generator extension to all neutrino flavors and inclusion of propagation through the Earth*, ANTARES-Soft/2004-010.
- [14 ] T. Montaruli and I. Sokalski, *A tau neutrino generator: first results*, ANTARES-Phys/2003-003.
- [15 ] T. Montaruli and I. Sokalski, *Influence of neutrino interaction and muon propagation media on neutrino-induced muon rates in deep underwater detectors*, ANTARES-Phys/2003-001.
- [16 ] I. Sokalski and T. Montaruli, *MUMv1r4: Corrections to photo-nuclear*

*cross section,  $\tau$ -lepton propagation through matter and possibilities on  $\tau$ -lepton identification, ANTARES-Soft/2002-014.*

- [17 ] T. Montaruli and A. Romeyer, *Conventional and prompt atmospheric neutrino fluxes*, ANTARES-Phys/2001-015.
- [18 ] R. Bellotti, F. Ciaccio and T. Montaruli, *A code for  $\tau$  lepton propagation: PROPTAU v0r0*, ANTARES-Soft/2001-009.