

CURRICULUM VITAE



EUGENIO COCCIA

GENERAL INFORMATION

Eugenio Coccia is Full Professor of Physics since 2000 at the University of Rome “Tor Vergata”. He is an experimental physicist with expertise in astroparticle physics, with a focus on gravitational wave experiments and interest on neutrinos and cosmic rays detectors. He is recognized for the development of ultracryogenic detectors of gravitational waves.

He graduated in Physics, cum laude, from the University of Rome “La Sapienza” in 1980 in the group of Edoardo Amaldi and Guido Pizzella; he has been Post-Doc and Fellow at CERN (1981-1985), research scientist (1985-1987) and associate professor (1988-1999) at the University of Rome “Tor Vergata”. He spent long periods at CERN, at the INFN Frascati Laboratory and at INFN Gran Sasso Laboratory, and shorter periods at the University of Leiden, in the Kamerlingh Onnes Laboratory.

He has directed the EXPLORER experiment at CERN (1998-2010) and leads the NAUTILUS experiment at the INFN Frascati Laboratories. He is a member of the large European laser interferometer gravitational-wave experiment VIRGO in Pisa.

At present, he is the Director of the INFN Centre of Advanced Studies “Gran Sasso Science Institute”, Chair of the Gravitational Wave International Committee (GWIC), member of the Astroparticle Physics International Committee (APPIC), member of the Council of the European Physical Society and of the Italian Physical Society.

He has been the Director of the INFN Gran Sasso Laboratory (2003-2009), Chair of the INFN Scientific Committee on Astroparticle Physics (2002-2003) and President of the Italian Society of General Relativity and Gravitational Physics (2000-2004). He has been member of international committees as ECFA (European Committee on Future Accelerators) and PANAGIC (Particle and Nuclear Astrophysics and Gravitation International Committee), and has been invited to be a member of international panels on the strategies of particle and astroparticle physics by CERN, the OECD Global Science Forum, the US National Academy of Sciences and the European Physical Society.

He has given lectures and seminars in Universities and research centers all over the world and is the author of about 300 scientific articles in international journals and editor of six books in the field of astroparticle physics.

AWARDS

- He was awarded the Prize for scientific activity, dedicated to young physicists, by the Italian Physical Society in 1983.
- In 2012 he is awarded the “Occhialini Medal” and Prize by the Institute of Physics (IOP) and the Italian Physical Society *“For his major contribution to the realisation of the first long term observatories with cryogenic and ultracryogenic detectors of gravitational waves, and for his international role in the gravitational wave community and in the broader community of astroparticle physics.”*
- In 2011 the President of the Italian Republic awarded him the honour of *Commendatore*, Order of Merit of the Italian Republic.

CHARGES

SCIENTIFIC MANAGEMENT

2012: Director of the INFN Centre of Advanced Studies “Gran Sasso Science Institute”

2011: Chairman of GWIC (Gravitational Wave International Committee)

<http://gwic.ligo.org/>. GWIC is affiliated to the IUPAP (International Union of Pure and Applied Physics) as Working Group 11.

2003 -2009: Director of the INFN National Laboratories of Gran Sasso and member of the INFN Board of Directors.

2003-2009: Team Leader INFN of the European project (FP6) ILIAS, the Integrated Large Infrastructures for Astroparticle Science.

2004 -2009: Chair of Comag (Coordination and Management Committee of the European Underground Labs), consisting of the Directors of the European underground laboratories.

2002-2003: Chairman of the INFN Scientific Committee on Astroparticle and neutrino physics.

2000-2004: President of SIGRAV (Italian Society of General Relativity and Gravitational Physics, www.sigrav.org). Tullio Regge is the Honorary President.

From 1998: Spokesman of the ROG Collaboration, internationally recognized for the activity of the gravitational wave detectors EXPLORER and NAUTILUS.

SCIENTIFIC COMMITTEES

2014 - : MEMBER OF APPIC (ASTROPARTICLE PHYSICS INTERNATIONAL COMMITTEE), affiliated to the IUPAP.

2013 - : Member of the Council of the Italian Physical Society (SIF)

2012 - : Member of the scientific council of the ENIGMASS Labex.

This new structure federates activities of four laboratories of Rhone-Alpes region LAPP and LPTH Annecy-le-Vieux, LPSC Grenoble and LSM.

2010 - : Member of the Council of the European Physical Society.

2010: Member of ASEPS (Asia-Europe Physics Summit) <http://www.aseps.net/>

2006 - 2012: Member of PANAGIC (Particle and Nuclear Astrophysics and Gravitation International Committee).

2004 - 2009: Member of ECFA (European Committee on Future Accelerators).

1994: Founder of the "Edoardo Amaldi Conference on Gravitational Waves ", which is held biennially in rotation in several continents and is recognized as the reference conference in the field.

STRATEGY AND EVALUATION PANELS

2012 - : Referees for the Evaluation of research projects on behalf of the Italian Ministry of Education, University and Research and for the Evaluation of research products (VQR 2004-2010) on behalf of ANVUR

2012 - : Chair of the the Evaluation Panel of the 3rd ASPERA Common Call

2010 - : Member of the Evaluation Committee of the Fermi Center.

2010 - 2011: Member of the OECD Global Science Forum Working Group on Astroparticle Physics.

2009-2011: Member of the National Academy of Sciences Committee for the assessment of a deep underground science laboratory - http://www.nap.edu/catalog.php?record_id=13204

2004 -2005: Member of the CERN Strategy Group, for the European Roadmap on Particle Physics.

1999-2001: Member of the Evaluation Working Group of INFN.

- **Evaluator of projects** for American institutions, such as the National Science Foundation and the Department of Energy, Japanese, such as the Institute for Cosmic Ray Research, and Italian as the CIVR and ANVUR.

- **Referee of international journals** such as Phys. Rev. Letters, Phys. Rev. D, Class. & Quantum Grav., Int J. of Modern Phys.

SCIENTIFIC ACTIVITY

Main topics of the activity: Development and use of quantum technologies on gravitational wave experiments: ^3He - ^4He dilution refrigerators, superconducting electronics and dcSquids; Acoustic and seismic noise reduction on cryogenic experiments; Study of the effect of cosmic rays and charged particle beams on acoustic detectors; Study of the GW signals from astrophysical sources in various gravitational theories, in particular scalar tensor theories; Study of the properties and feasibility of spherical GW detectors; Study of the correlation of GW detectors data with gamma-ray and neutrino bursts detectors data; Interest on cosmic ray detectors and neutrino physics.

He is recognized for the development of ultracryogenic GW detectors, making use of ^3He - ^4He dilution refrigerator to reduce the detector thermal noise. He is the leader of the EXPLORER experiment at CERN, terminated in 2010, and of the NAUTILUS experiment at the INFN National Laboratories of Frascati, in continuous data taking since 2003.

NAUTILUS has been the first ultracryogenic GW detector in the world. It's the first detector to have acoustically measured the passage of cosmic rays and holds the record for the lowest temperature reached by a massive object of several tons (0.09 K).

The main results obtained with EXPLORER and NAUTILUS range from the upper limits on the arrival of pulses of gravitational waves and on the presence of a stochastic background, to the first dynamic measurement of the gravitational field generated by an artificial source; from the first acoustic detection of cosmic rays to the study of correlations with the neutrino pulses and gamma rays.

From 2006 he participates to the Virgo experiment, the large European interferometer at the European Gravitational Observatory, Pisa, which is the top effort in Europe in this field.

He spent long research periods at CERN and in the INFN Laboratories of Frascati and of Gran Sasso, and short periods at the Kamerlingh Onnes Laboratory of the University of Leiden (Netherlands) and at the University of Barcelona (Spain).

From 2003 to 2009 he has directed the Gran Sasso underground laboratories. These laboratories are the major underground research infrastructure of the world. They have a staff of about 80 employees and about 900 scientific users, half of them from abroad. He has managed the installation of a new generation of experiments (including OPERA, ICARUS, BOREXINO) and of new safety actions in the underground laboratory. He promoted new initiatives for technology transfer to local companies and new initiatives in the outreach, thanks to grants from Europe, the Abruzzo Region and bank foundations.

He has been invited to give seminars and lectures in many universities and research centers in the world (CERN, Fermilab, MIT, Caltech, Princeton, Yale, Oxford, RAL, Orsay, PSI, Leiden, NIKHEF, Potsdam, Dubna, Moscow, Tokyo), and plenary talks at many international conferences. He got several research grants by EU, INFN, MIUR, EGO. He has published about 300 articles in international journals and is editor of 6 books on astroparticle physics and gravitational waves.

See <http://scholar.google.com/citations?user=N4oy8fEAAAJ&hl=en>.

TEACHING ACTIVITY

Since 1985, he taught semester training courses for the Degrees in Physics and in Chemistry at the University of Rome "Tor Vergata" (General Physics, Experimental Physics, Laboratory of Physics, Gravitational Physics).

He participates to the International Master Erasmus Mundus on Astronomy and Astrophysics, named "Astromundus".

He has been member of the Councils of Teachers for the PhDs in Physics and in Astronomy at the University of Rome "Tor Vergata". He taught cycles of lessons and has organized several PhD schools in Italy and abroad, notably at the University of Tokyo, at Fermilab in Chicago and in various locations in Europe, also as a member of the Steering Committee of SIGRAV and as a member of the Scientific Committee of the International School of Astroparticle Physics (ISAPP) and of the International Doctorate School on Astroparticle Physics (IDAPP).

15 selected papers

Beating the spin-down limit on gravitational wave emission from the Vela pulsar.
The LIGO and the Virgo Collaborations
Astrophys. J. 737, 93, 2011

Search for Gravitational Wave Bursts from Six Magnetars.
The LIGO and the Virgo Collaborations
Astrophys. J. 734, L35, 2011

All-sky search for gravitational-wave bursts in the first joint LIGO-GEO-Virgo run.
The LIGO and Virgo Collaborations
Phys. Rev. D81, 102001, 2010

IGEC2: A 17-month search for gravitational wave bursts in 2005-2007.
The IGEC Collaboration (Auriga, Allegro and ROG Collaborations)
Phys. Rev. D82 022003, 2010

Detection of high energy cosmic rays with the resonant gravitational wave detector NAUTILUS and EXPLORER.
P. Astone et al (ROG Collaboration)
Astropart. Phys. 30, 200-208, 2010

An upper limit on the stochastic GW background of cosmological origin
The LIGO and Virgo Collaborations
Nature 460, 08278, 2009

Neutrinos from Supernovae as a Trigger for GW Search
G. Pagliaroli, F. Vissani, E. Coccia, W. Fulgione
Phys. Rev. Lett. 103, 031102, 2009

On the possible sources of gravitational wave bursts detectable today.
E. Coccia, F. Dubath, M. Maggiore.
Phys. Rev. D 70:084010, 2004.

Increasing the bandwidth of resonant gravitational antennas.
P. Astone et al. (ROG Coll.)
Phys. Rev. Lett. 91:111101, 2003.

Study of the coincidences between the gravity wave detectors EXPLORER and NAUTILUS in 2001
P. Astone et al. (ROG Coll.)
Classical and Quantum Gravity, 19, 5449-5463, 2002

First search for GW bursts with a network of detectors.
Z.A. Allen et al. (IGEC Collaboration)
Phys. Rev. Lett. 85:5046-5050, 2000.

Cosmic rays observed by the resonant GW detector NAUTILUS.
P. Astone et al. (ROG Coll.)
Phys. Rev. Lett. 84:14-17, 2000.

The gravitational wave detector NAUTILUS operating at T= 0.1 K
P. Astone et al. (ROG Coll.)

Astroparticle Physics, 7, 231-243, 1997

Experimental study of the dynamic Newtonian field with a cryogenic GW antenna.

P. Astone et al. (ROG Coll.)

Eur. Phys. J. C5:651-664, 1998.

First cooling below 0.1-K of the new GW antenna 'Nautilus' of the Rome group.

P. Astone et al. (ROG Coll.)

Europhys. Lett. 16:231-235, 1991.

Books

R. Aloisio, E. Coccia, N. Fornengo, L. Pandola

TAUP 2009: Proceedings of the Eleventh International Conference on Topics in Astroparticle and Underground Science

(Institute of Physics, 2010)

A. Bottino, E. Coccia, J. Morales, J. Puimedon

TAUP 2005: Proceedings of the Ninth International Conference on Topics in Astroparticle and Underground Science

(Institute of Physics, 2006)

I. Ciufolini, E. Coccia, M. Colpi, V. Gorini, R. Peron

Recent Developments in Gravitational Physics

(Institute of Physics, 2006)

I. Ciufolini, E. Coccia, V. Gorini, R. Peron, N. Vittorio

From the Hubble length to the Planck length

(Institute of Physics, 2005)

E. Coccia, G. Pizzella, G. Veneziano

Gravitational waves

Proceedings of the second Edoardo Amaldi Conference on GWs

(World Scientific, 1999)

E. Coccia, G. Pizzella, F. Ronga

Gravitational waves experiments

Proceedings of the first Edoardo Amaldi Conference on GWs

(World Scientific, 1995)