

Curriculum vitae (10/2020)

Gianluca Imbriani

Nationality: **Italian**
Main field of Interest: Experimental Nuclear Physics,
Nuclear Astrophysics,
Stellar Evolution and Stellar Physics

SC - 02A1

SSD – FIS04

URL for web site: <https://www.docenti.unina.it/gianluca.imbriani>

Since the beginning of my research activity I have been involved in both experimental nuclear physics and theoretical stellar evolution, measuring nuclear cross sections of astrophysical interest and evaluating their impact in stellar evolution and nucleosynthesis. I am leading the Nuclear Experimental group of the Department of Physics of University of Naples *Federico II*.

• EDUCATION

1997-2000 Ph.D. in Fundamental and Applied Physics, Department of Physics, University of Naples “Federico II”, Italy, Supervisor Prof. F. Terrasi, “Stellar evolution and nuclear reaction rates: an experimental and theoretical study”.

AA 1995-96 Master Degree cum Laude in Physics, University of Naples “Federico II”, Italy.

• CURRENT POSITIONS and QUALIFICATIONS

2020 – Full Professor, Department of Physics, University of Naples “Federico II”, Italy.

2018 – today Coordinator of Nuclear Physics section of the Department of Physics, University of Naples “Federico II”, Italy.

2015 – today Project Manager for the design, tender out and execution phases for the supply and installation of a single stage electrostatic accelerator for the Laboratory for Underground Nuclear Astrophysics MV (LUNAMV) *progetto premiale*, at National Laboratory of Gran Sasso, funded by Italian Institute of Nuclear Physics (INFN).

2014 – today National Scientific Qualification as Full Professor for the field of “Experimental physics of fundamental interactions”.

• RESEARCH PERFORMANCES

Publications: 110 papers on international refereed journals, 4 review papers, on Review of Modern Physics, Annual Review of Nuclear and Particle Physics, Reports on Progress in Physics and Europhysical Journal respectively.

4400 citations and h-index 35 (scopus);

4200 citations and 34 h-index (ISI).

Average citation per item (2008-2018) = 29.8

More than 30 oral presentations at national and international meetings and conferences, with 15 invited talks at international conferences and 2 plenary sessions talk.

- **PREVIOUS POSITIONS & FELLOWSHIP**

- 2016 – 2018 Adjunct Professor, Department of Physics, University of Notre Dame, Indiana, USA
- 2015 – 2020 Associate Professor, Department of Physics, University of Naples “Federico II”, Italy.
- 2007 – 2015 Researcher (Assistant Professor), Department of Physics, University of Naples “Federico II”, Italy
- 2006 – 2007 University teaching staff including researchers, University of Notre Dame, USA
- 2005 – 2006 Post-doc associated researcher, Observatory of Teramo, Italian National Institute of Astrophysics (INAF)
- 2004 – 2005 Post-doc associated researcher, Department of Physics, University of Naples “Federico II”
- 2002 – 2004 Post-doc associated researcher, National Laboratory of Gran Sasso (LNGS), INFN
- 2001 – 2002 Post-doc associated researcher, Ruhr Universität of Bochum (Germany)
- 2000 – 2001 Post-doc associated researcher, Department of Environmental Science, University of Campania “L. Vanvitelli”, Italy

- **VISITING**

- 2016 From June to September, University of Notre Dame, Indiana, USA
- 2009 Month of October, University of Notre Dame, Indiana, USA
- 2008 From July to September, University of Notre Dame, Indiana, USA

- **FUNDING ID AND INDIVIDUAL GRANTS**

- 2020 – Spoke Person of LUNA (Laboratory for Underground Nuclear Astrophysics) international collaboration, funded by INFN (about 300 kEuro per year).
- 2014 – 2018 Naples Unit Responsible for the project: “Nucloesynthesis in AGB stars: an integrated approach”, funded by the Italian Ministry of University (MIUR) - PRIN - (90 kEuro).
- 2012 – today Naples Unit Responsible for the LUNAMV project (Progetto Premiale - MIUR).
- 2007 – today Naples Unit responsible for the LUNA experiment at National Laboratory of Gran Sasso, funded by INFN (about 50 kEuro per year).
- 2010 – 2014 Principal Investigator for the project: “Nucloesynthesis in AGB stars: ^{19}F production”, funded in the framework of FIRB Futuro in Ricerca call of the MIUR (600 kE).

- **GRANTS AS A MEMBER OF REASEARCH GROUPS:**

- 2007- Local responsible for the LUNA experiment at National Laboratory of Gran Sasso, funded by INFN.
- 1997-2007 Participant of LUNA experiment at National Laboratory of Gran Sasso, experiment funded by INFN.
- 2008- Participant of the experiment European Recoil separator for Nuclear Astrophysics (ERNA) at CIRCE laboratory of Second University of Naples, funded by INFN and DFG Germany.
- 1998-2008 Participant of the experiment European Recoil separator for Nuclear Astrophysics (ERNA) at Dynamitron Tandem Laboratory of Bochum University, experiment funded by INFN and DFG Germany.

• **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

- 2019 – 2020 Supervisor of the activity of the PostDoc Dr. J. Balibrea, Department of Physics, University of Naples “Federico II”.
- 2016 – 2019 Coordinator of the activity of the RTDA fellowship held by Dr. A. Best, Department of Physics, University of Naples “Federico II”.
- 2017 – 2018 Supervisor of the master thesis of A. La Manna “Characterization of particle detectors for Nuclear Astrophysics”, Department of Physics, University of Naples “Federico II”.
- 2013 – 2016 Co-Supervisor of the PhD thesis of A. Boeltzig “Direct Measurements of $^{23}\text{Na}(p,\alpha)^{24}\text{Mg}$ cross section at stellar energy”, Gran Sasso Science Institute. L’Aquila.
- 2011 – 2013 Supervisor of the activity of the PostDoc Dr. D. Schuermann, Department of Physics, University of Naples “Federico II”.
- 2010 – 2013 Coordinator of the activity of the RTD fellowship held by Dr. A. Di Leva, Department of Physics, University of Naples “Federico II”.
- 2007 – 2011 Co-Supervision of the PhD thesis of P.J. Le Blanc “Measurement and R-matrix analysis of $^{15}\text{N}(p,\alpha)^{16}\text{O}$ reaction cross section”, University of Notre Dame, USA.
- 2008 – 2009 Co-Supervisor of the master thesis of F. Lombardi “Flusso di neutrino dal sole: un test per il modello standard”, Department of Physics, University of L’Aquila.

• **ORGANISATION OF SCIENTIFIC MEETINGS**

- 2019 Editor of the Conference Proceedings Book “Nuclei in the Cosmos XV”, Springer
- 2018 SOC for 15th International Symposium on Nuclei in the Cosmos, Assergi, Italy, June 24-29.
- 2009 “The role of low energy fusion reactions in nuclear astrophysics: carbon burning”, Villa Orlandi, Anacapri, Naples, Italy, May 14-16, 2009.

• **INSTITUTIONAL RESPONSIBILITIES**

- 2018 Member of the evaluation board of the PhD in Physics, University of Milan.
- 2017 Member of the evaluation board of the PhD in Physics, University of Genova.
- 2017 Member of the evaluation commission for a Junior Faculty (RTDB), University of Padua.

- 2017 Member of the evaluation board of the PhD in Physics, University of Granada, Spain.
- 2016 Member of the evaluation commission to select a Junior Faculty (RTDB), University of Naples Federico II.
- 2016 – Member of the PhD School Committee of the Department of Physics, University of Naples “Federico II”.
- 2013 – 1017 Member of the permanent evaluation commission to select PostDocs for the Naples section of INFN.
- 2011 – 2014 Member of the Rector advisory team on the evaluation of Academic Research, University of Naples Federico II.
- 2009 – 2012 Member of the Board of the University of Naples Federico II.

- **REVIEWING ACTIVITIES**

- 2019 – Reviewer for Agence Nationale de la Recherche, France.
- 2014 – today Reviewer for Ministero dell’Università e Ricerca, Italia.
- 2008 – today Reviewer for the American Physical Society Journals (PRC and PRL).

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2019 – Senior Participant and Coordinator of Focus Area 1 (Nuclear Reaction Data), International Research Network for Nuclear Astrophysics (IReNA), Nuclear Science Foundation, USA.
- 2018 – Member of the Research Network, Chemical Elements as Tracers of the Evolution of the Cosmos (CHETEC), COST action, EU.
- 2006 – Member of Joint Institute for Nuclear Astrophysics – Centre for Evolution Elements (JINA-CEE), University of Notre Dame, USA.

- **Selected Scientific Charges:**

- 2017- Responsible for the g-detection setup for the measurement of $^{12}\text{C}+^{12}\text{C}$ cross section at LUNAMV.
- 2017- Responsible for the measurement of the reaction $^{12}\text{C}(p,\alpha)^{13}\text{N}$ at LUNA.
- 2015-2018 Responsible for the measurement of the reaction $^{23}\text{Na}(p,\alpha)^{24}\text{Mg}$ at LUNA.
- 2010-2014 Principal Investigator of the project: **Nucleosynthesis in AGB stars: ^{19}F production**, aiming to measure $^{14}\text{N}(\alpha,n)^{18}\text{F}$ and $^{15}\text{N}(\alpha,n)^{19}\text{F}$.
- 2011-2012 Development of an intense nitrogen beam to measure $^{14,15}\text{N}(\alpha,n)^{18,19}\text{F}$.
- 2009-2011 Working group leader for the preparation of a review paper on Reviews of Modern Physics, in the framework of the international workshop “Solar Fusion Cross Sections for the pp chain and CNO cycle”, held at the Institute on nuclear theory of Washington University, Seattle, USA, funded by JINA institute, Nuclear Science Foundation USA.
- 2009-2010 Co-author of the review “The cold and the hot CNO cycles” published on ANNUAL REVIEW OF NUCLEAR AND PARTICLE SCIENCE.
- 2008-2009 Co-author of a review about the LUNA experiment “LUNA: a Laboratory for Underground Nuclear Astrophysics” published on Reports on Progress in Physics.

- 2007-2010 Responsible for $^{15}\text{N}(p,\alpha)^{16}\text{O}$ cross section measurement in the framework of a collaboration between LUNA and Notre Dame university, funded by INFN, DFG (German Society of Research), BMBF (Federal Ministry of Research of Germany) and JINA (Joint Institute of Nuclear Astrophysics, Notre Dame - USA).
- 2006-2008 Responsible for $^{25}\text{Mg}(p,\alpha)^{26}\text{Al}$ cross section measurement in the framework of LUNA experiment, funded by INFN, DFG (German Society of Research) and BMBF (Federal Ministry of Research of Germany).
- 2002-2005 Responsible for $^{14}\text{N}(p,\alpha)^{15}\text{O}$ cross section measurement with the high resolution set up in the framework of LUNA experiment, funded by INFN, DFG (German Society of Research) and BMBF (Federal Ministry of Research of Germany).
- 1999-2003 Responsible for the evaluation of the astrophysical influence of the $^{12}\text{C}(\alpha,n\alpha)^{16}\text{O}$ reaction rate in the stellar evolution in the framework of ERNA experiment, funded by INFN.
- 1999-2000 Responsible for $p+^7\text{Be}$ elastic scattering measurement in the framework of NABONA experiment, funded by INFN, DFG (German Society of Research) and BMBF (Federal Ministry of Research of Germany).

- **Teaching activity:**

- 2019-2020 Lecturer to the Course of Physics with Laboratory for Mathematics degree, University of Naples Federico II.
- 2019-2020 Lecturer to the Course of Nuclear Astrophysics for Physics degree, University of Naples Federico II.
- 2018-2019 Lecturer to the Course of Physics with Laboratory for Mathematics degree, University of Naples Federico II.
- 2018-2019 Lecturer to the Course of Nuclear Astrophysics for Physics degree, University of Naples Federico II.
- 2017-2018 Lecturer to the Course of Physics with Laboratory for Mathematics degree, University of Naples Federico II.
- 2016-2017 Lecturer to the Course of Physics with Laboratory for Mathematics degree, University of Naples Federico II.
- 2016-2017 Member of PhD Board of the Physics Department of University of Naples Federico II
- 2015-2016 Lecturer to the Course of Physics with Laboratory for Environmental Science degree, University of Naples Federico II.
- 2015-2016 Lecturer to the Course of Nuclear Astrophysics for Physics degree, University of Naples Federico II.
- 2014-2015 Lecturer to the Course of Physics with Laboratory for Environmental Science degree, University of Naples Federico II.
- 2014-2015 Lecturer to the Course of Nuclear Astrophysics for Physics degree, University of Naples Federico II.
- 2013-2014 Lecturer to the Course of Physics with Laboratory for Environmental Science degree, University of Naples Federico II.
- 2012-2013 Lecturer to the Course of Physics with Laboratory for Environmental Science degree, University of Naples Federico II.
- 2013 Lecturer at Euro Summer School: Experimental Nuclear Astrophysics, Santa Tecla, Catania, "Direct measurements of cross sections of astrophysical interest and their impact on stellar modelling".
- 2011-2012 Lecturer to the Course of Physics with Laboratory for Environmental Science degree, University of Naples Federico II.
- 2011 Lecturer at Euro Summer School: Experimental Nuclear Astrophysics, Santa Tecla, Catania, "Standard Solar Model Data Needs".

- 2010-2011 Assistant to the Physics II Course for Physics degree, University of Naples Federico II.
- 2009-2010 Assistant to the Physics II Course for Physics degree, University of Naples Federico II.
- 2008-2009 Assistant to the Physics II Course for Physics degree, University of Naples Federico II.
- 2007-2008 Assistant to the Physics II Course for Physics degree, University of Naples Federico II.
- 2009 Lecturer at Euro Summer School: Experimental Nuclear Astrophysics, Santa Tecla, Catania, “Why to go underground to study the stars”.
- 2007-2010 Co-Supervisor of PhD thesis of P.J. Le Blanc “Measurement and R-matrix analysis of $^{15}\text{N}(p,\gamma)^{16}\text{O}$ reaction cross section”, University of Notre Dame.
- 2008-2009 Co-Supervisor of master thesis of Francesco Lombardi “Flusso di neutrini dal sole: un test per il modello standard” AA 2008-2009.
- 2005 Lecturer at Euro Summer School: Experimental Nuclear Astrophysics , Santa Tecla, October 2005, “Underground laboratory studies of pp and CNO and astrophysical consequences”.
- 2000-2001 Assistant to the Course of Physics II for Mathematics degree, Second University of Naples.

International Cooperation:

- 2007- Participant to the Joint Institute of Nuclear Astrophysics (JINA)
- 2008-2009 Responsible for the Italian side of the Italian-Spain Grant involving the nuclear astrophysics group of INFN section of Naples and the Stellar Evolution group of Granada University, in the framework of the agreement between INFN and MEC (Ministerio de Educacion, Cultura y Deporte)
- 2003-2004 Responsible for the Italian side of the Italian-Spain Grant involving the nuclear astrophysics group of INFN section of Naples and the Stellar Evolution group of Granada University, in the framework of the agreement between INFN and MEC (Ministerio de Educacion, Cultura y Deporte)

Organization of International Meetings:

- 2009 “The role of low energy fusion reactions in nuclear astrophysics: carbon burning”, Villa Orlandi, Anacapri, Naples, Italy, May 14-16, 2009
- 2018 LOC Nuclei in the Cosmos, LNGS June 2018

<u>Selected invited talks</u>	
	Nuclear Astrophysics at Rings and Recoil Separators, GSI Darmstadt, March 13 - 15, 2018
	Fifth International Workshop for the Design of the ANDES Underground Laboratory, Buenos Aires, Argentina 29 - 30 June 2017
	Gordon Research Conferences frontiers in science – Nuclear Chemistry, 2017, New London, New Hampshire.
	ATHENA Brussels Workshop on Astrophysics, January 27-28, 2014, Brussels
	XXXVI Brazilian meeting on nuclear physics, September 01-05 2013, Maresias, Brasil
	The origin of cosmic elements, June 12-15, 2013, Barcelona

XII International Symposium on Nuclei in the Cosmos, “ <i>Underground experiments and their impact in stellar modeling</i> ”, 5-10 August 2012, Cairns, Australia
ENSAR - 2nd THEXO Workshop, “ <i>Direct measurements of cross sections of Astrophysical interest at LUNA</i> ”, 22-24 October 2012 - ECT*, Trento, Italy
Annual Fall Meeting of the Division of Nuclear Physics of the American Physical Society, “ <i>Underground measurements of cross sections of Astrophysical interest</i> ”, Santa Fe, USA 2-6 November 2010
24th International Nuclear Physics Conference (INPC2010) “ <i>Direct measurements of cross sections of Astrophysical interest</i> ” - Plenary Talk , Vancouver, Canada, July 4-9, 2010
3rd Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan, “ <i>Standard Solar model data needs</i> ”, Waikoloa, Hawaii, October 13-17, 2009
Solar Fusion Cross Sections for the pp chain and CNO cycle, “ <i>Standard Solar model data needs</i> ”, Institute for Nuclear Theory, University of Washington, January 2009
The IXth Torino Workshop on Evolution and Nucleosynthesis in AGB Stars, “ <i>The LUNA experiment: $^{25}\text{Mg}(p,\gamma)^{26}\text{Al}$ and $^{15}\text{N}(p,\gamma)^{16}\text{O}$</i> ”, 22-26 October 2007, Perugia

25/10/2020