

Albino Perego

Department of Physics
University of Trento
Via Sommarive 14
38123 Trento
Italy

Phone: +39 02 6448 2350 (Milano Bicocca)
Office: 3-w 36
Email: albino.perego@unitn.it
Homepage: albinoperego.eu

Appointments

- December 2018–present **Assistant Professor (Ricercatore Tempo Determinato tipo B)**
Department of Physics
University of Trento
- July 2017– December 2018 **Postdoctoral Research Associate (Assegnista di Ricerca)**
Istituto Nazionale di Fisica Nucleare (INFN)
Sezione di Milano Bicocca e Gruppo Collegato di Parma
Theoretical Nuclear and Relativistic Astrophysics
- January 2013–June 2017 **Postdoctoral Research Associate**
Technische Universität Darmstadt
Institute for Nuclear Physics – Theory center
Theoretical Nuclear Astrophysics
- April–May 2016, Paternity Leave (full-time)
March & June–December 2016, Part-time job (75% time) for parental care
- October 2008–December 2012 **Postgraduate Researcher and Teaching Assistant**
Basel University
Physics Department
Theoretical Physics, Theoretical Nuclear Astrophysics group
- May–September 2008, **Postgraduate Scholarship**
University of Milano-Bicocca
Theoretical Astrophysics

Education

Ph.D. Theoretical Physics

Basel University

Thesis title: *"Neutrino treatment in multidimensional astrophysical simulations: a new spectral approach"*

Supervisor: Prof. Friedrich-Karl Thielemann

Received: 13 December 2012, Grade: Summa Cum Laude

Laurea Specialistica in Fisica (M.Sc. in Physics)

University of Milano.

Curriculum: Theoretical Physics.

Thesis title: *"Spin evolution in supermassive black hole binaries"*

Supervisors: Prof. Pierre Pizzocchero, Prof Monica Colpi

Received: April 2008, Grade: 110/110 Cum Laude

Laurea Triennale in Fisica (B.S. in Physics)

University of Milano.

Thesis title: *"Production of W +jets in hadron colliders"*

Supervisors: Prof. Stefano Forte
 Received: October 2005, Grade: 110/110 Cum Laude

Research Interests

Theoretical and nuclear astrophysics, multimessenger and relativistic astrophysics, neutrino astrophysics, core-collapse supernovae, compact binary mergers, computational physics, nucleosynthesis, gravitational waves, gamma-ray bursts

Memberships

International Collaborations

Member of ENGRAVE, *Electromagnetic Counterparts of Gravitational Wave sources at the Very Large Telescope*, the largest European Consortium for the electromagnetic follow-up and interpretation of gravitational wave sources, since March 2018. **Coordinator of the Theory Working group** since September 2018.

Member of GRAWITA, *Gravitational Wave INAF Team*, Italian team for the electromagnetic follow-up and interpretation of gravitational sources, since November 2017.

Member of Virgo Collaboration (Prometeo theory group): probationary year since November 2017. Full access and authorship expected after November 2018. **Responsabile Locale Milano Bicocca unit**, since April 2018.

Member of INFN TEONGRAV Group since July 2017.

Member of CoRe (Computational Relativity) collaboration since July 2017.

Member of SFB 1245 Action, *Nuclei: From Fundamental Interactions to Structure and Stars* since January 2016.

Research Networks

Member of PHAROS, *The multi-messenger physics and astrophysics of neutron stars* (ESF-COST Action CA16214) since January 2018.

Member of GWVerse, *Gravitational waves, black holes and fundamental physics* (COST Action CA16104), **Group leader of WG1c** (Numerical relativity/SPH with GR+matter+plasma) since January 2018.

Member of NewCompStar, *Exploring fundamental physics with compact stars* (MPNS COST Action MP1304), 2013–2017

Member of Supernova HP2C Project, Basel University, January 2010–December 2012

Member of CompStar, *The physics of compact stars* (ESF-funded RPN Action), 2009–2012

Member of EuroGrad Doctoral School, Basel University, October 2008–October 2010

Grants, Honours, & Awards

April 2018, **Best Presentation Prize**, XVII Incontri di Fisica delle Alte Energie 2018 (IFAE 2018), Milano Bicocca, Italy

June 2016, First prize for the **Best Poster Award**, XIV Nuclei in the Cosmos Symposium, Niigata, Japan

2010, 2011 & 2012, **Best Teaching Assistant Award**, Basel University, Switzerland

January 2010, Compstar Short Visit Grant to visit Jacobs University, Bremen, Germany

HPC Grants at the Gauss Supercomputing Center (Germany)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

November 2018 – November 2019, CI of the proposal “Simulating gravitational-wave and electromagnetic signals from neutron star collisions”, 75M SU @ Leibnitz Supercomputing Center (LRZ)

HPC Grants at the Italian Supercomputing Center (CINECA)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

August 2018 – July 2019, PI of the proposal “TASMANIA: targeted simulation in Numerical Relativity“, 4.5M SU

HPC Grants at the Swiss Supercomputing Center (CSCS)

(Peer-reviewed, SU = service units or core-hours, PI = principal investigator, CI = co-investigator)

April 2016–March 2018, PI of the proposal “Neutrinos in the aftermath of neutron star mergers“, 10M SU

April 2013–March 2016, CI of the proposal “Matter accretion on compact objects: the role on neutrinos, magnetic field and equation of state“, 36M SU

April 2013–March 2016, CI of the proposal “ELEPHANT: a 3D supernova model for efficient parameter studies with spectral neutrino transport“, 15M SU

January 2010–December 2012, CI of the proposal “Productive 3D models of stellar explosions“

Professional services

January 2018, **Organization of the workshop** *Four challenges in gravitational-wave astronomy with neutron stars*, Parma, 16-17 January 2018

2015–present, **Referee** for Physical Review Letter, Physical Review C, The International Journal of Modern Physics D, Journal of Physics G: Nuclear and Particle Physics, The Astrophysical Journal, The Astrophysical Journal Letters, Monthly Notices of the Royal Astronomical Society, Monthly Notices of the Royal Astronomical Society Letters, Journal of High-Energy Astrophysics

Spring Semester 2011, Organizer of the Journal Club Seminars, Basel University

2010–present, Main developer of the Advanced Spectral Leakage scheme code (soon to be publically released)

2009-2010, Co-Developer of the AGILE-IDSa public code (grey leakage scheme for heavy flavor neutrinos)

Teaching

International Graduate School

March 2019, invitation for 4 hour lecture at the Pharos PhD school: *Multimessenger Physics and Astrophysics with Compact binary mergers*, Jena (DE)

November 2018, 6 hour lecture at the Pharos Training school: *Electromagnetic counterparts of neutron star mergers*, Bertinoro (IT)

May 2018, 2 hour lecture at the *Waves on the lake SIGRAV* school, Como, Villa del Grumello (Lecture: Modelling of binary neutron star mergers in numerical relativity, in collaboration with Prof. Sebastiano Bernuzzi)

March 2018, Tutor at the *Frontiers in Nuclear and Hadronic Physics* school, Firenze, Galileo Galilei Institute (Lecture: Nuclear Astrophysics, in collaboration with: Prof. G. Martinez-Pinedo)

March 2017, 45' Lecture at Rußbach School on Nuclear Astrophysics, Rußbach am PaßGschütt (AT)

Università degli Studi di Parma

Spring Semester 2018, 4 hours lecture on Nucleosynthesis in Supernovae and binary Compact Mergers for the course: Selected themes in Theoretical Physics (Prof. S. Bernuzzi and Prof. Massimo Pietroni)

Università degli Studi di Milano Bicocca

Spring Semester 2018, 2 hours lecture for the Gravitational Waves course (Prof. M. Colpi)

Fall Semester 2017, 10 hours lecture on Supernovae for the Stellar Astrophysics course (Prof. M. Colpi)

TU Darmstadt

Fall Semester 2015, Teaching Assistant, General Relativity (Prof. Wambach, Prof. A. Arcones)

Spring Semester 2013 & 2015, Teaching Assistant, Introduction to Theoretical Astrophysics (Prof. Arcones)

Fall Semester 2013 & 2014, Tutor for Students, Computational aspects of strong interaction physics

Spring Semester 2013, Tutor for Students, Nuclear Structure and Nuclear Astrophysics

Basel University

Spring Semester 2009, 2010 & 2012, Teaching Assistant, Nuclear Astrophysics II (Dr. T. Rauscher)

Fall Semester 2011, Teaching Assistant, Nuclear Astrophysics I (Dr. T. Rauscher)

Spring Semester 2011, Teaching Assistant, Electrodynamics (Prof. F.-K. Thielemann)

Fall Semester 2010, Teaching Assistant, Introduction to Astrophysical Plasma (Dr. M. Liebendörfer)

Fall Semester 2009, Teaching Assistant, Mathematical Method III (Dr. Andreas Aste)

Student Mentoring and Advising

external co-advisor of two PhD students (Stockholm University and GSSI-L'Aquila)

co-advisor of four master students (2 at TU-Darmstadt, 2 at University of Milano Bicocca)

co-advisor of four bachelor students (1 at TU-Darmstadt, 3 at University of Milano Bicocca)

mentor for three PhD students (2 at TU-Darmstadt, 1 at Basel University)

mentor for one master student (TU-Darmstadt)

Outreach

3 May 2018, Public talk "Binarie di stelle di neutroni in coalescenza: laboratori cosmici di fisica fondamentale per la neonata astrofisica multimessenger", University of Milano, Milano

13 November 2017, Master class "GW170817: cosa è successo il 17 Agosto 2017 e perché è così importante per l'astrofisica del futuro", Osservatorio Astronomico di Brera, Milano

16 Ottobre 2017, "Gravity under a new light: nuovi segnali dal cosmo", public event to announce the first binary neutron star observation, University of Parma, Parma

29 September 2017, participation to the European Researchers' night, University of Parma, Parma

24 October 2016, Talk "Aspettando l'onda: binary NS mergers come laboratorio di fisica fondamentale", Public event "GR100+1: Suoni dal Cosmo", University of Milano-Bicocca

23-25 June 2011, Public exhibition for the Scientific Committee of the EU parliament, Royal Belgian Institute for Natural Science, Bruxelles

Publications

Papers

35 articles published (or accepted for publication) in peer-reviewed journals (November 2009– January 2019)

7 articles as first author

95% with short author list (≤ 9)

63%(81%) within 3th(4th) author position

25 articles without PhD advisor

2 articles submitted to peer-reviewed journals (January 2019)

≥ 850 citations (January 2018)

h-index: 15 (January 2018)

Conference proceedings

15 conference proceedings published in peer-reviewed journals (3 as first author, 2 as second author)

1 conference proceeding submitted for peer-reviewed publication (as first author)

Seminar and Conference Presentations

11 Invited Talks at International Conferences and Workshops

25 Seminars at International Academic Institutions

27 Contributing Talks at National and International Conferences and Workshops

3 Posters presented at International Conferences and Workshops

Personal

Citizenship: Italian

Date of Birth: 23 September 1983

Place of Birth: Lecco

Status: Married, one Child (born in January 2016)

Languages

Mother tongue: Italian

Advanced knowledge of written and spoken English (C1)

Good knowledge of written and spoken German (B2)

Elementary knowledge of written and spoken French (A2)

Main Scientific Achievements

(“[numbers]” refer to the complete publication list in the next pages)

- largest to-date systematic analysis of dynamical ejecta and electromagnetic emission from binary neutron star mergers [5]
- largest to-date database of gravitational wave waveforms from binary neutron star mergers [10]
- development of multi-component, anisotropic kilonova model, and its application to GW170817 and long-lived remnants [19, 12]
- first study to combine multimessenger observations of GW170817 and numerical relativity models to constraint the nuclear Equation of State [12]
- first study of the effect of Kozai-Lidov resonance on compact binary merger evolution in the early Universe [14]
- first detailed post-processing study of the impact of weak reactions on dynamical ejecta from numerical relativity simulations of binary compact mergers [18]
- collaboration to the first systematic study of binary neutron star luminosity and to the largest gravitational wave catalog for binary neutron star [16]
- collaboration to the first detailed Core-Collapse Supernova code comparisons in 2D and 3D [7, 8]
- collaboration to the study of core-collapse supernova remnant and nucleosynthetic yields for an extensive set of progenitors [2, 1]
- first detailed study of the neutrino pair annihilation above binary neutron star merger remnant with a long-lived massive neutron star [20]
- first detailed study of the nucleosynthesis and electromagnetic counterpart from neutrino-driven winds above binary neutron star merger remnants [25]
- first detailed study of the emergence of neutrino-driven winds from binary neutron star merger remnants in 3D [27]
- development of a parametrized model to explode massive stars in spherical symmetry with detailed neutrino transport for nucleosynthesis studies [26]
- collaboration to the first studies of the Matter Neutrino Resonance above merger remnants based on hydrodynamics simulations [23, 22]
- development of a physically robust, inexpensive neutrino treatment for astrophysical applications [24]
- collaboration to the first 3D simulation of the magneto-rotationally driven core-collapse supernova leading to the production of r -process elements [32]
- first detailed study of the evolution of supermassive black hole spin in gaseous environment through cosmological history [33, 30]
- collaboration to the study of the neutrino-matter reactions in partially degenerate matter [31]
- first detailed study of the evolution of mass and spin of supermassive black holes accreting mass from a misaligned warped disk [35]

Complete List of Publications: Articles and reviews (including preprints)

- [1] *PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry III: Nucleosynthesis Yields*
S. Curtis, K. Ebinger, C. Fröhlich, M. Hempel, **A. Perego**, M. Liebendörfer, F.-K. Thielemann
The Astrophysical Journal, **870**, 2, 2019
- [2] *PUSHing Core-Collapse Supernovae to Explosions in Spherical Symmetry II: Explodability and Global Properties*
K. Ebinger, S. Curtis, C. Fröhlich, M. Hempel, **A. Perego**, M. Liebendörfer, F.-K. Thielemann
The Astrophysical Journal, **870**, 1, 2019
- [3] *Unveiling the enigma of ATLAS17aen*
A. Melandri, A. Rossi, S. Benetti, and 42 co-authors including **A. Perego**
Astronomy & Astrophysics, **621**, A81 (2019)
- [4] *Viscous-Dynamical Ejecta from Binary Neutron Star Merger*
D. Radice, **A. Perego**, K. Hotokezaka, S. Bernuzzi, S. A. Fromm, L. Roberts
The Astrophysical Journal Letters, **869**, L35 (2018)
- [5] *Binary neutron star mergers: mass ejection, electromagnetic counterparts and nucleosynthesis.*
D. Radice, **A. Perego**, K. Hotokezaka, S. Bernuzzi, S. A. Fromm, L. Roberts
The Astrophysical Journal, **869**, 130 (2018)
- [6] *Re-solving the jet/cocoon riddle of the first gravitational wave with an electromagnetic counterpart*
G. Ghirlanda, O. S. Salafia, Z. Paragi, and 33 co-authors including **A. Perego**
Accepted for publication in Science, arXiv:1808.00469
- [7] *Core-collapse supernovae in the hall of mirrors. A three-dimensional code-comparison project*
R. Cabezón, M. Liebendörfer, K.-C. Pan, T. Kuroda, K. Ebinger, O. Heinemann, **A. Perego**, F.-K. Thielemann
Astronomy & Astrophysics, **619**, A118, 2018
- [8] *The Impact of Different Neutrino Transport Methods on Multidimensional Core-collapse Supernova Simulations*
K.-C. Pan, C. Mattes, E. O'Connor, S. Couch, **A. Perego**, A. Arcones
Accepted for publication in Journal of Physics G, arXiv:1806.10030
- [9] *Black holes, gravitational waves and fundamental physics: a roadmap*
L. Barack, V. Cardoso, S. Nissanke, T.P. Sotiriou, and 196 co-authors including **A. Perego**
Submitted to Classical and Quantum Gravity, arxiv:1806.05195
- [10] *CoRe database of binary neutron star merger waveforms and its application in waveform development*
T. Dietrich, D. Radice, S. Bernuzzi, F. Zappa, **A. Perego**, B. Bruegmann, S. Vivekanandji Chaurasia, R. Dudi,
W. Tichy, M. Ujevic
Classical and Quantum Gravity Letters, **35**, 24LT01, 2018
- [11] *GW170817: Measurements of neutron star radii and equation of state*
B. P. Abbott, R. Abbott, T. D. Abbott, and 1147 co-authors including **A. Perego**
Physical Review Letters **121**, 161101, 2018
- [12] *Long-lived Remnants from Binary Neutron Star Mergers*
D. Radice, **A. Perego**, S. Bernuzzi, B. Zhang
Monthly Notices of the Royal Astronomical Society, **481**, 3, 2018
- [13] *Optimization of Finite-Differencing Kernels for Numerical Relativity Applications*
R. Alfieri, S. Bernuzzi, **A. Perego**, D. Radice
Journal of Low Power Electronics and Applications, **8(2)**, 15, 2018
- [14] *r-process nucleosynthesis in the early Universe through fast mergers of compact binaries in triple systems*
M. Bonetti, **A. Perego**, P. Capelo, M. Dotti, C. Miller
Publications of the Astronomical Society of Australia, **35**, 017, 2018

- [15] *Nucleosynthesis in Supernovae*
F.K.-Thielemann, I. Jordi, **A. Perego**, P. von Ballmoos
Space Science Reviews, **214**, 3, 62, 2018
- [16] *Gravitational-wave luminosity of binary neutron stars mergers*
F. Zappa, S. Bernuzzi, D. Radice, **A. Perego**, T. Dietrich
Physical Review Letters, **120**, 111101, 2018
- [17] *GW170817: Joint Constraint on the Neutron Star Equation of State from Multimessenger Observations*
D. Radice, **A. Perego**, F. Zappa, S. Bernuzzi
The Astrophysical Journal Letters, **852**, 2, 2018
- [18] *The role of weak reactions in dynamic ejecta from binary neutron star mergers*
D. Martin, **A. Perego**, W. Kastaun, A. Arcones
Classical and Quantum Gravity, **35**, 3, 2018
- [19] *AT 2017gfo: An Anisotropic and Three-component Kilonova Counterpart of GW170817*
A. Perego, D. Radice, S. Bernuzzi
The Astrophysical Journal Letters, **850**, L37, 2017
- [20] *Neutrino annihilation above merger remnants: implications of a long-lived massive neutron star*
A. Perego, A. Arcones, H. Yasin
Journal of Physics G, “Emerging leaders” special issue, **44**, 084007, 2017
- [21] *The properties of short gamma-ray burst jets triggered by neutron star mergers*
A. Murguia-Berthier, E. Ramirez-Ruiz, G. Montes, F. De Colle, L. Rezzolla, S. Rosswog, K. Takami, **A. Perego**, W. H. Lee
The Astrophysical Journal Letters, **835**, L34, 2017
- [22] *Neutrino flavor evolution in binary neutron star merger remnants*
M. Frensel, M.-R. Wu, C. Volpe, **A. Perego**
Physical Review D, **95**, 023011, 2017
- [23] *Matter Neutrino Resonance Transitions above a Neutron Star Merger Remnant*
Y. Zhu, **A. Perego**, G. McLaughlin
Physical Review D, **94**, 105006, 2016
- [24] *An Advanced Leakage Scheme for neutrino treatment in astrophysical simulations*
A. Perego, R. Cabezón, R. Käppeli
The Astrophysical Journal Supplement Series, **223**, 22, 2016
- [25] *Neutrino-driven winds in the aftermath of a neutron star merger: nucleosynthesis and electromagnetic transients*
D. Martin, **A. Perego**, A. Arcones, F.-K. Thielemann, O. Korobkin, S. Rosswog
The Astrophysical Journal, **813**, 2, 2015
- [26] *Pushing 1D CCSNe to explosions: model and SN 1987A*
A. Perego, M. Hempel, C. Fröhlich, K. Ebinger, M. Eichler, J. Casanova, M. Liebendörfer, F.-K. Thielemann
The Astrophysical Journal, **806**, 275, 2015
- [27] *Neutrino-driven winds from neutron star merger remnants*
A. Perego, S. Rosswog, R. Cabezón, O. Korobkin, R. Käppeli, A. Arcones, M. Liebendörfer
Monthly Notices of the Royal Astronomical Society, **443**, 4, 2014
- [28] *MODA: a new algorithm to compute optical depths in multidimensional hydrodynamic simulations*
A. Perego, E. Gafton, R. Cabezón, S. Rosswog, M. Liebendörfer
Astronomy & Astrophysics, **568**, A11, 2014
- [29] *Effects of Circumnuclear Disk Gas Evolution on the Spin of Central Black Holes*
U. Maio, M. Dotti, M. Petkova, **A. Perego**, M. Volonteri
The Astrophysical Journal, **767**, 1, 2013

- [30] *On the Orientation and Magnitude of the Black Hole Spin in Galactic Nuclei*
M. Dotti, M. Colpi, S. Pallini, **A. Perego**, M. Volonteri
The Astrophysical Journal, **762**, 68, 2013
- [31] *Neutrino Processes in Partially Degenerate Neutron Matter*
S. Bacca, K.R. Hally, M. Liebendörfer, **A. Perego**, C. Pethick, A. Schwenk
The Astrophysical Journal, **758**, 34, 2012
- [32] *Magnetorotationally Driven Supernovae as the Origin of Early Galaxy r-process Elements?*
C. Winteler, R. Käppeli, **A. Perego**, A. Arcones, N. Vasset, N. Nishimura, M. Liebendörfer, F.-K. Thielemann
The Astrophysical Journal Letters, **750**, L22, 2012
- [33] *Dual BHs in merger remnants - II: spins evolution and gravitational recoil*
M. Dotti, M. Volonteri, **A. Perego**, M. Colpi, M. Ruzsokowski, F. Haardt
Monthly Notices of the Royal Astronomical Society, **402**, 1, 2010
- [34] *Neutrino Radiation-Hydrodynamics: General Relativistic versus Multidimensional Supernova Simulations*
M. Liebendörfer, T. Fischer, M. Hempel, R. Käppeli, G. Pagliara, **A. Perego**, I. Sagert, J. Schaffner-Bielich, S. Scheidegger, F.-K. Thielemann, S.C. Whitehouse
Progress of Theoretical Physics Supplement, **186**, 2010
- [35] *Mass and spin coevolution during the alignment of a black hole in a warped accretion disc*
A. Perego, M. Dotti, M. Colpi, M. Volonteri
Monthly Notices of the Royal Astronomical Society, **399**, 4, 2009

Complete List of Publications: Conference Proceedings

1. *Neutrinos in neutron star mergers: nucleosynthesis and kilonova*
A. Perego
Submitted to Nuovo Cimento della Società Italiana di Fisica. “IFAE 2018” Conference, Milano, 2018
2. *Matter ejection and kilonova emission from binary neutron star mergers*
A. Perego
Proceedings of Science. Gravitational-waves Science Symposium “GRASS 2018” Conference, Padova, 2018
3. *ν -driven winds from the remnant of binary neutron star mergers*
A. Perego
Journal of Physics: Conference Series. “VII Nuclear Physics in Astrophysics” Conference, York, 2018
4. *Synthesis of heavy elements in the ejecta of neutron star mergers*
D. Martin, **A. Perego**, A. Arcones, F.-K. Thielemann, O. Korobkin, S. Rosswog
Journal of Physics: Conference Series, “VII Nuclear Physics in Astrophysics” Conference, York, 2018.
5. *PUSHing core-collapse simulations to explosions*
C. Fröhlich, **A. Perego**, M. Hempel, K. Ebinger, M. Eichler, J. Casanova, F.-K. Thielemann, M. Liebendörfer
Journal of Physics: Conference Series, “VII Nuclear Physics in Astrophysics” Conference, York, 2018.
6. *Explosive Nucleosynthesis in Core-Collapse Supernovae: the Titanium Problem*
M. Eichler, C. Fröhlich, M. Hempel, K. Ebinger, **A. Perego**, J. Casanova, F.-K. Thielemann, Liebendörfer M.
Journal of Physics: Conference Series. “VII Nuclear Physics in Astrophysics” Conference, York, 2018. Seminars,
7. *Explosion dynamics of parametrized spherically symmetric core-collapse supernova simulations*
K. Ebinger, **A. Perego**, M. Hempel, C. Fröhlich, M. Eichler, J. Casanova, F.-K. Thielemann, M. Liebendörfer
Journal of Physics: Conference Series. “VII Nuclear Physics in Astrophysics” Conference, York, 2018.
8. *Optimization of Finite-Differencing Kernels for Numerical Relativity Applications.*
R. Alfieri, S. Bernuzzi, **A. Perego**, D. Radice
Advances in Parallel Computing, 2018.

9. *Neutrinos in binary neutron star mergers.*
A. Perego, A. Arcones, D. Martin, H. Yasin
 JPS Conference Proceedings, “XIV Nuclei in the Cosmos” Symposium (NIC2016), Niigata, 2016.
10. *Explosion dynamics of parametrized spherically symmetric core-collapse supernova simulations.*
 K. Ebinger, S. Sihna, C. Fröhlich, **A. Perego**, M. Hemepl, M. Eichler, J. Casanova, F.-K. Thielemann, M. Liebendörfer
 JPS Conference Proceedings, “XIV Nuclei in the Cosmos” Symposium (NIC2016), Niigata, 2016.
11. *Pushing core-collapse supernovae to explosion in spherical symmetry: nucleosynthesis yields.*
 S. Sihna, C. Fröhlich, K. Ebinger, **A. Perego**, M. Hemepl, M. Eichler, F.-K. Thielemann, M. Liebendörfer
 JPS Conference Proceedings, “XIV Nuclei in the Cosmos” Symposium (NIC2016), Niigata, 2016.
12. *The role of neutrinos in binary neutron star mergers.*
A. Perego
 Submitted to Proceedings of “XXVII Rencontres de Blois, Particle Physics and Cosmology”, 2016.
13. *Nucleosynthesis in the Ejecta of Neutron Star Mergers*
 D. Martin, **A. Perego**, A. Arcones, O. Korobkin, F.-K. Thielemann
 Proceedings of Science, “XIII Nuclei in the Cosmos” Conference, Debrecen, 2014
14. *Parametrized Spherically Symmetric Core Collapse Supernova Simulations: PUSH*
 K. Ebinger, **A. Perego**, M. Hempel, C. Fröhlich, M. Eichler, J. Casanova, M. Liebendörfer, F.-K. Thielemann
 Proceedings of Science, “XIII Nuclei in the Cosmos” Conference, Debrecen, 2014
15. *r-Process in Jet Ejecta of Magnetorotational Core Collapse Supernovae*
 F.-K. Thielemann, R. Käppeli, C. Winteler, **A. Perego**, M. Liebendörfer, N. Nishimura, N. Vasset, A. Arcones
 Proceedings of Science, “XII Nuclei in the Cosmos” Conference, Cairns, 2012
16. *On the role of black hole spin and accretion in powering relativistic jets in AGN*
 L. Maraschi, M. Colpi, G. Ghisellini, **A. Perego**, F. Tavecchio
 Journal of Physics: Conference Series, **355**, 1, “International Workshop on Beamed and Unbeamed Gamma-Rays from Galaxies”, Muonio, 2012
17. *A path to radio-loudness through gas-poor galaxy merger and the role of retrograde accretion*
 M. Dotti, M. Colpi, L. Maraschi, **A. Perego**, M. Volonteri
 ASP Conference Series, **427**, “Accretion and Ejection in AGN: A global view”, 2010

Full List of Seminar and Conference Presentations

1. Seminar, *Neutron Star Mergers, Electromagnetic Counterparts and Nucleosynthesis*.
Institut für Theoretische Physik – Jena (Germany), 28 October 2018
2. **Invited talk**, *Binary neutron star mergers: Observations and modelling in multimessenger astronomy era*
“DISCRETE Conference” 6th Symposium on Prospects in the Physics of Discrete Symmetries, Vienna (AT),
26 November 2018
3. Seminar, *Multimessenger Astrophysics and Fundamental Physics*
Trento University – Trento (Italy), 8 November 2018
4. Seminar, *Neutron star mergers, neutrinos and electromagnetic counterparts in the gravitational wave detector era*.
Radboud University – Nijmegen (Netherlands), 11 October 2018
5. Contributed talk, *Systematics of dynamical ejecta and electromagnetic counterparts from binary neutron star mergers*.
TEONGRAV annual meeting, Università La Sapienza – Roma (Italy), 17 September 2018
6. Seminar, *Multimessenger and neutrino astrophysics in the gravitational wave detector era*.
SISSA, Trieste (Italy), 13 September 2018
7. Seminar, *r-process nucleosynthesis and kilonova emission from binary neutron star mergers*.
Padova Astronomical Observatory and INAF Group, Padova (Italy), 6 September 2018
8. **Invited talk**, *GW170817 EM counterpart: evidence of anisotropic, multicomponent mass ejection (tentative title)*
FRIB Theory Alliance Topical Program - Implication of the neutron star merger GW170817 and its associated
kilonova, Michigan State University, East Lansing (USA), 16 July 2018
9. Contributed talk, *Neutrinos in binary NS mergers: ejecta, nucleosynthesis and EM counterparts*
XV Nuclei in the Cosmos Symposium, LNGS – L’Aquila (Italy), 29 July 2018
10. Contributed talk, *Modelling of EM counterparts of compact binary mergers: ejecta, neutrinos and nucleosynthesis*
GEMMA workshop, Lecce (Italy), 8 June 2018
11. Seminar, *Binary neutron star modelling in the multimessenger astronomy era: GW, neutrinos and nucleosynthesis*
Perugia University and INFN Group, Perugia (Italy), 26 May 2018
12. Contributed talk, *Neutrini nella coalescenza di stelle di neutroni: nucleosintesi e kilonova*
XVII IFAE 2018 workshop, Milano Bicocca (Italy), 8 June 2018
13. **Invited talk**, *Constraints on the Nuclear EOS from GW and EM observations of Binary Neutron Star Mergers*
PAFT 2018, Current Problems in Theoretical Physics conference, Vietri sul Mare (Italy), 26 March 2018
14. Contributed talk, *Modeling of matter ejection and kilonova emission from binary NS mergers*
GRASS 2018 workshop, Padova (Italy), 1 March 2018
15. **Invited talk**, *GW and EM signals from numerical simulations of compact binary mergers*
GWverse Conference, La Valletta (Malta), 22 January 2018
16. Seminar, *GW170817 and the beginning of the multimessenger era*
Ferrara University and INFN Group, Ferrara (Italy), 20 December 2017
17. **Invited talk**, *GW170817/AT2017gfo: multimessenger modeling of the EM counterpart and joined constraints on the nuclear EOS*
“The Italian contribution to the dawn of multimessenger astronomy era”, GRAWITA workshop, GSSI –
L’Aquila (Italy), 2 December 2017
18. **Invited talk**, *Neutrinos in neutron star mergers and core-collapse supernovae*
Theoretical Nuclear Physics in Italy conference, Cortona (Italy), 3 October 2017

19. **Invited talk**, *Neutrino reactions above binary neutron star merger remnants...and more*
“Electromagnetic Signature of r-process Nucleosynthesis in NS Binary Mergers” workshop at the Institute for Nuclear Theory, Seattle (USA), 14 August 2017
20. Contributed talk, *Modelling BNS mergers and their aftermath: the role of neutrinos*
“Electromagnetic Signature of r-process Nucleosynthesis in NS Binary Mergers” 17-2b program at the Institute for Nuclear Theory, Seattle (USA), 02 August 2017
21. Contributed talk, *Neutrino reactions above binary neutron star mergers remnants*
Nuclear Astrophysics in GW astronomy era, ETC*, Trento (Italy), 13 June 2017
22. Seminar, *Neutrinos in binary neutron star mergers: the fundamental microphysics for multimessenger astronomy*
Parma University and INFN Group, Parma (Italy), 19 April 2017
23. **Invited talk**, *Weak reactions in binary NS mergers: status and challenges*
NewCompstar annual Conference, Warsaw (Poland), 30 March 2017
24. Seminar, *Neutrinos and binary neutron star mergers at dawn of multimessenger astronomy era*
Pisa University and INFN Group, Pisa (Italy), 2 March 2017
25. Seminar, *Neutrinos in binary NS mergers: a step towards multimessenger astrophysics.*
Stockholm University, Stockholm (Sweden), 27 January 2017
26. **Invited talk**, *Parametrized models for nucleosynthesis in core-collapse supernovae.*
Supernova Workshop ISSI, Bern (Switzerland), 5 October 2016
27. Contributed talk, *Neutrinos in neutron star mergers.*
XXVIII Rencontres de Blois: “Particle physics and Cosmology“ (France), 1 June 2016
28. Seminar, *The role of neutrinos in neutron star mergers.*
University of Trento (Italy), 31 March 2016
29. Contributed talk, *PUSH: parametrized neutrino-driven explosions in one dimensional core collapse supernovae for nucleosynthesis calculations.*
Nugrid Workshop: Nucleosynthesis away from stability, Frankfurt (Germany), 9 October 2015
30. **Invited talk** *What is the role of neutrinos in Galactic Chemical Evolution?.*
Splinter meeting, German Astronomical Society meeting, Kiel (Germany), 18 September 2015
31. Seminar, *The role of neutrinos in core collapse supernovae and neutron star mergers.*
Brera Observatory, Merate (Italy), 9 September 2015
32. Contributed talk, *The role of neutrinos in the ejection of matter from binary neutron star mergers.*
IV Microphysics In Computational Relativistic Astrophysics workshop, Oskar Klein Centre and Nordita, Stockholm (Sweden), 18 August 2015
33. **Invited talk** *Neutrino-matter interaction in core collapse supernovae and neutron star mergers, and the role of the nuclear equation of state.*
NUMSYM15 symposium, Krakow (Poland), 30 June 2015
34. Contributed talk, *Nucleosynthesis and transients in the neutrino-driven wind from the remnant of binary neutron star mergers*
NewCompstar annual Conference, Budapest (Hungary), 15 June 2015
35. Seminar, *The role of neutrinos in core collapse supernovae and neutron star mergers*
Konkoly Observatory, Budapest (Hungary), 18 June 2015
36. Seminar, *The role of neutrinos in core collapse supernovae and neutron star mergers*
University of Milano-Bicocca (Milano), Italy, 29 May 2015
37. Contributed talk, *Neutrino-driven wind from the remnant of binary neutron star mergers*
VII Nuclear Physics in Astrophysics Conference, York (England), 12 May 2015

38. Seminar, *Stellar explosions at galactic scales: how can stars influence a galaxy?*
Galaxy coffee talk at Max Planck Institut für Astronomie, Heidelberg (Germany), 4 May 2015
39. Contributed talk, *Neutrino-driven wind from the remnant of binary neutron star mergers*
German Physical Society meeting, Heidelberg (Germany), 23 March 2015
40. Contributed talk, *Neutrino-matter interaction in core collapse supernovae and neutron star mergers*
Nuclear Astrophysics Virtual Institute meeting, GSI, Darmstadt (Germany), 26 February 2015
41. Seminar, *Neutrino-driven wind from the remnant of binary neutron star mergers*
Triangle Nuclear Theory Seminar, North Carolina State University, Raleigh (USA), 20 November 2014
42. Contributed talk, *Neutrino-driven wind in the aftermath of neutron star mergers*
"The r -process: status and challenges" workshop at the Institute for Nuclear Theory, Seattle (USA), 23 July 2014
43. Contributed talk, *Neutrino-driven wind in the aftermath of neutron star mergers*
XVII Nuclear Astrophysics Workshop, Ringberg (Germany), 7-11 April 2014
44. Contributed talk *Neutrino-driven wind in the aftermath of neutron star mergers*
NewCompstar annual Conference, Firenze (Italy), 24 March 2014
45. Contributed talk, *Neutrino-driven wind in the aftermath of neutron star mergers*
"GRBs in Kyoto" Conference, Kyoto (Japan), 15 November 2013
46. Contributed talk, *Neutrino modelling in the aftermath of neutron star mergers*
III Microphysics In Computational Relativistic Astrophysics workshop, ETC*, Trento (Italy), 24 September 2013
47. Seminar, *The inner working of core collapse supernovae*
Oskar Klein Centre, Stockholm University, Stockholm (Sweden), 28 June 2013
48. Contributed talk, *Neutrino emission from the aftermath of neutron star merger*
XLI Workshop on Gross Properties of Nuclei and Nuclear Excitations, Hirschegg (Austria), 29 January 2013
49. Seminar, *Neutrino transport in multi-dimensional core collapse supernova simulations*
Technische Universität Darmstadt, Institut für Kernphysik Theoriezentrum, Darmstadt (Germany), 14 June 2012
50. Seminar, *Neutrino transport in multi-dimensional core collapse supernova simulations*
North Carolina State University, Raleigh (USA), 24 May 2012
51. Seminar, *3D magneto-rotationally driven supernovae*
Jacobs University, Bremen (Germany), 12 April 2012
52. Contributed talk, *A new approximated neutrino treatment for astrophysical simulations*
XVI Nuclear Astrophysics Workshop, Ringberg (Germany), 12 April 2012
53. Contributed talk, *An approximated neutrino treatment for multi-D astrophysical simulations*
Annual Compstar 2011 workshop, Catania (Italy), 9 May 2011
54. Seminar, *Neutrinos in core-collapse supernovae*
University of Milano-Bicocca, Milano (Italy), 21 December 2010
55. Seminar, *Neutrinos in core collapse supernova*
Jacobs University, Bremen (Germany), 14 October 2010
56. Contributed talk, *Numerical Astrophysics: tools and models*
EUROGRAD annual meeting, Todtmoos (Germany), 28 September 2010
57. Contributed talk, *A leakage scheme for neutrinos in core collapse supernovae*
EUROGRAD annual meeting, Todtmoos (Germany), 27 September 2010

58. Contributed talk, *A NLO leakage scheme for neutrino in core collapse supernova*
XV Nuclear Astrophysics Workshop, Ringberg (Germany), 24 March 2010
59. Seminar, *Spin and mass evolution during BH spin alignment*
Jacobs University, Bremen (Germany), 22 February 2010
60. Seminar, *The role of neutrinos in core collapse supernova*
Laboratoire de l'Univers et de ses Theories, Paris Observatory, Meudon (France), 10 December 2009
61. Contributed talk, *μ , τ neutrinos in core collapse supernova simulations*
Microphysics In Computational Relativistic Astrophysics workshop, Niels Bohr Institute, Copenhagen (Denmark), 20 August 2009
62. Contributed talk, *μ and τ neutrinos in core collapse supernovae*
EUROGRAD annual meeting, Hallstatt (Austria), 27 September 2009
63. Seminar, *SMBH spin and mass evolution during spin alignment*
University of Insubria, Como (Italy), June 2009

Posters

1. Poster contribution, *Neutrinos in binary neutron star merger remnants*
XIV "Nuclei in the Cosmos" Symposium, Niigata (Japan), 20-24 June 2016
2. Poster contribution, *PUSHing spherically symmetric core-collapse supernovae to explosion*
German Astronomical Society meeting, Kiel (Germany), 15-18 September 2015
3. Poster contribution, *Observables and Models of Stellar Explosions*
Swiss Supercomputing Centre users day, Luzern (Switzerland), September 2009

List of Student Mentored and Advised

(Ad = Advisor, CAd = Co-Advisor, Me = Mentor)

- June 2018–present, Diego Vescovi (PhD Student), GSSI-L'Aquila, CAd (Ad: Prof. M. Branchesi, Dr. S. Cristallo)
- May 2018–present, Lorenzo Branca (M.Sc. Student), University of Milano Bicocca, CAd (Ad: Prof. M. Colpi)
- May 2018–present, Stefano Sormani (B.Sc. Student), University of Milano Bicocca, CAd (Ad: Prof. M. Colpi)
- November 2017–October 2018, Mattia Rosati (B.Sc. Student), University of Milano Bicocca, CAd (Ad: Prof M. Dotti)
- November 2017–October 2018, Luca Triglia (B.Sc. Student), University of Milano Bicocca, CAd (Ad: Prof M. Dotti)
- November 2017–February 2018, Elia Cenci (B.Sc. Student), University of Milano Bicocca, CAd (Ad: Prof. M. Colpi)
- November 2016–present, Davide Gizzi (PhD Student), Stockholm University, CAd (Ad: Prof. S. Rosswog)
- January 2015–present, Carlos Mattes (PhD Student), TU Darmstadt, Me (Ad: Prof A. Arcones)
- September 2014–July 2015, Hannah Yasin (M.Sc. Student), TU Darmstadt, CAd (Ad: Prof. A. Arcones)
- January 2014–May 2017, Dirk Martin (PhD Student), TU Darmstadt, Me (Ad: Prof. A. Arcones)
- October 2013–November 2014, Carlos Mattes (M.Sc. Student), TU Darmstadt, Me (A: Prof. A. Arcones)
- January 2013–April 2013, Hannah Yasin (B.Sc. Student), TU Darmstadt, CAd (A: Prof. A. Arcones)
- October 2013–August 2014, Paul Mekhedjian (M.Sc. Student), TU Darmstadt, CAd (A: Prof. A. Arcones)
- September 2012–March 2017, Kevin Ebinger (PhD Student), Basel University, Me (A: Prof F.-K. Thielemann)

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