

Dr. Albino Perego

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Birthday: September 23rd, 1983
Place of birth: Lecco, Italy
Citizenship: Italian

Current affiliation: Institute of Nuclear Physics (IKP),
Technische Universität Darmstadt
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Education and employments

- 2013- **Post-Doctoral position**, *TU-Darmstadt*, Darmstadt, Germany.
Post-Doctoral position at the Technische Universität Darmstadt, in the Theoretical Astrophysical group of Prof. Dr. Almudena Arcones (Helmholtz Young Investigator Group).
- 2008-2012 **Philosophiae Doctor degree**, *University of Basel*, Basel, Switzerland, *Summa cum Laude*.
PhD student at the University of Basel, in the Astro-Theoretical group, under the supervision of Professor Matthias Liebendörfer and Professor Friedrich-Karl Thielemann
- 2008 **Scholarship**, *University of Milano-Bicocca*, Milano, Italy.
Three months scholarship at the University of Milano-Bicocca, under the supervision of Professor Monica Colpi.
- 2005-2008 **Laurea magistrale**, *Università degli Studi di Milano*, Milano, Italy, *110/110 cum laude*.
Italian Master Degree in Physics, Curriculum of Theoretical Physics
- 2002-2005 **Laurea triennale**, *Università degli Studi di Milano*, Milano, Italy, *110/110 cum laude*.
Italian Bachelor Degree in Physics
- 1996-2002 **Diploma**, *Liceo Giovanni Battista Grassi*, Lecco, Italy, *100/100 cum encomio*.
Diploma at a scientific high school

Experiences

Research

- January 2010-December 2012 **Supernova HP2C project: Productive 3D Models of Stellar Explosions.**
I have been working with the Computational Astro-Nuclear group at the University of Basel (Principal Investigator: Matthias Liebendörfer), in collaboration with the Computational group at the University of Geneva (Principal Investigator: Martin J. Gander) at the HP2C project "Supernova".
- Since December 2009 **The aftermath of neutron star merger.**
I have been working with Professor Matthias Liebendörfer (University of Basel), Professor Stephan Rosswog (Jacobs University Bremen) and Doctor Ruben Cabezon (University of Basel) on the study of the aftermath of neutron star merger and on its neutrino emission. Since April 2011, this work is computationally supported by the Swiss National Supercomputing Center (CSCS) under the production project s414.
- Since December 2008 **Weak processes and numerical simulations of core collapse supernova.**
I have been working with Professor Matthias Liebendörfer, the nuclear astrophysics group (University of Basel), Achim Schwenk (TU Darmstadt) and Chris Pethick (NORDITA) on the improvement of weak processes and approximated neutrino treatments in the context of dense and hot matter, in particular during supernova explosion and in magnetically driven supernova explosions. These projects are currently computationally supported by CSCS (production projects s414).
- Since May 2007 **Temporal evolution of massive black hole mass and spin, during cosmic evolution.**
I have been working with Professor Monica Colpi (University of Milano-Bicocca), Doctor Massimo Dotti and Professor Marta Volonteri (University of Michigan, Ann Arbor). We studied, with an analytical approximated model, the alignment process of the spin of a supermassive black hole with the orbital angular momentum of its accretion disc.

April 2005 - **Production of W particles and jets in hadron colliders.**
October 2005 I worked under the supervision of Doctor Alessandro Vicini and Professor Stefano Forte (University of Milano) on the calculation of the hadronic cross section for the production of W particles in proton-proton colliders, using different partonic distributions for the nucleon structure.

Presentations and seminars

- January 2013 **Neutrino emission from the aftermath of neutron star merger**, *XLI Workshop on Gross Properties of Nuclei and Nuclear Excitations*, Hirschegg, Austria.
- June 2012 **Neutrino transport in multi-dimensional core collapse supernova simulations**, *TU Darmstadt*, Darmstadt, Germany.
- May 2012 **Neutrino transport in multi-dimensional core collapse supernova simulations**, *North Carolina State University*, Raleigh, USA.
- April 2012 **3D magneto-rotationally driven supernovae**, *Jacobs University Bremen*, Bremen, Germany.
- March 2012 **A new approximated neutrino treatment for astrophysical simulations**, *XVI Nuclear Astrophysics Workshop*, Ringberg, Germany.
- May 2011 **An approximated neutrino treatment for multi-D astrophysical simulations**, *Compstar 2011 workshop*, Catania, Italy.
- October 2010 **Neutrinos in CCSN**, *Jacobs University Bremen*, Bremen, Germany.
- March 2010 **A NLO leakage scheme for neutrino in CCSN**, *Ringberg Castle*, XV Nuclear Astrophysics Workshop, Ringberg, Germany.
- February 2010 **Spin and mass evolution during BH spin alignment**, *Jacobs University Bremen*, Bremen, Germany.
- December 2009 **The role of neutrinos in CCSN**, *LUTh, Observatoire de Paris*, Meudon, France.
- August 2009 **μ and τ neutrinos in CCSN simulations**, *MICRA workshop, Niels Bohr Institute*, Copenhagen, Denmark.
- June 2009 **SMBH spin and mass evolution during spin alignment**, *Insubria University*, Como, Italy.

Posters

- September 2012 **Spectral neutrino emission in the aftermath of 3D neutron star mergers**, *CSCS Users day*, In collaboration with Dr. Ruben Cabezon, Lugano, Switzerland.
- September 2011 **Numerical Simulation of Magnetically Driven Core-Collapse Supernovae**, *CCCS Fair PhD students day and CSCS users day*, in collaboration with R. Käppeli, Basel and Luzern, Switzerland.
- September 2009 **Observables and Models of Stellar Explosions**, *CSCS Users day*, Luzern, Switzerland.

Teaching

- Spring 2013 **An Introduction to Theoretical Astrophysics**, *TU Darmstadt*.
Exercises tutor for students (Lecturer: Prof. Dr. Almudena Arcones).
- Spring 2012 **Nuclear Astrophysics II**, *University of Basel*.
Exercises tutor for master students (Lecturer: Prof. Dr. Thomas Raucher). Best Tutor award.
- Autumn 2011 **Nuclear Astrophysics I**, *University of Basel*.
Exercises tutor for master students (Lecturer: Prof. Dr. Thomas Raucher). Best Tutor award.
- Spring 2011 **Electrodynamics**, *University of Basel*.
Exercises tutor for bachelor students (Lecturer: Prof. Dr. Friedrich-Karl Thielemann).
- Autumn 2010 **Introduction to Astrophysical Plasma**, *University of Basel*.
Exercises tutor for master students (Lecturer: Prof. Dr. Matthias Liebendörfer). Best Tutor award.
- Spring 2010 **Nuclear Astrophysics II**, *University of Basel*.
Exercises tutor for master students (Lecturer: Prof. Dr. Thomas Raucher).
- Autumn 2009 **Mathematical Method III**, *University of Basel*.
Exercises tutor for bachelor students (Lecturer: Prof. Dr. Andreas Aste).
- Spring 2009 **Nuclear Astrophysics II**, *University of Basel*.
Exercises tutor for master students (Lecturer: Prof. Dr. Thomas Raucher).

Languages

- Language Italian
Level Mother tongue
- Language English

Level Good knowledge of written and spoken English (B2)

Language French

Level Elementary knowledge of written and spoken French (A2)

Language German

Level Elementary knowledge of written and spoken German (A2)

Computer skills

Operating Systems Linux, Windows

Languages C, Fortran 77/90, LaTeX, OpenMP, MPI

Mathematical software Mathematica, Matlab, SuperMongo

Publications

Authors Bacca S., Hally K. R., Liebendörfer M., Perego A., Pethick C., Schwenk A.

Title Neutrino Processes in Partially Degenerate Neutron Matter

Accepted by ApJ

Authors Winteler C., Käppeli R., Perego A., Arcones A., Vasset N., Nishimura N., Liebendörfer M., Thielemann F.-K.

Title Magnetorotationally Driven Supernovae as the Origin of Early Galaxy r-process Elements?

Accepted by ApJ Letter

Authors Maraschi L., Colpi M., Ghisellini G., Perego A., Tavecchio F.

Title On the role of black hole spin and accretion in powering relativistic jets in AGN

Journal of Physics: Conference Series

Authors Maio U., Dotti M., Petkova M., Perego A., Volonteri M.

Title How fast black holes spin in quasars

Accepted by ApJ

Authors Dotti M., Colpi M., Maraschi L., Perego A., Volonteri M.

Title A path to radio-loudness through gas-poor galaxy merger and the role of retrograde accretion

Proceedings of the conference "Accretion and Ejection in AGN: A global view", June 2009, Como, Italy

Authors Dotti M., Volonteri M., Perego A., Colpi M., Ruszkowski M., Haardt F.

Title Dual BHs in merger remnants - II: spins evolution and gravitational recoil

Accepted by MNRAS 2010

Authors Liebendörfer M., Fischer T., Hempel M., Käppeli R., Pagliara G., Perego A., Sagert, I., Schaffner-Bielich J., Scheidegger S., Thielemann F.-K., Whitehouse S.C.

Title Neutrino Radiation-Hydrodynamics: General Relativistic versus Multidimensional Supernova Simulations

Progress of Theoretical Physics Supplement

Authors Perego A., Dotti M., Colpi M., Volonteri M.

Title Mass and spin coevolution during the alignment of a black hole in a warped accretion disc

Accepted by MNRAS, 2009