

Clément Stahl

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Born 23 June 1990

Nationality : French

Education

2013-2017	PhD in Theoretical Cosmology ICRANet Pescara, Italy Supervisor: Prof. Remo Ruffini Title: On early and late phases of acceleration of the expansion of the universe Visiting PhD student in Nordita, Stockholm (january 2016-june 2016)
2012-2013	Master in Nuclei Particles Astroparticles and Cosmology University Paris XI, Orsay, France Speciality: Cosmology Grade: " <i>Bien</i> "
2011-2012	Master in Theoretical Physics Imperial College, London Erasmus agreement between the University Paris XI and Imperial College. Grade: " <i>Bien</i> ", Certificate: <i>Imperial College International Diploma</i>
2010-2011	Licence 3 in Fundamental Physics University Paris XI, Orsay, France Grade: " <i>Très bien</i> "
2008-2010	Undergraduate training "Classes préparatoires aux grandes écoles" in Mathematics-Physics Lycée Kléber, Strasbourg, France

Professional experience in cosmology

2017-present	Postdoctoral fellow in Theoretical Cosmology Pontificia Universidad Catolica de Valparaiso, Chile
04-06/2013	Loop Quantum Cosmology in the Cosmic Microwave Background Supervisor : Dr. Julien Grain, Institut d'Astrophysique Spatiale (IAS) Orsay With a phenomenological approach, I computed the primordial tensorial power spectrum at the end of the inflation within a loop quantum cosmology framework.
06-07/2012	Perturbation in the inflation Supervisor: Dr. Carlo Contaldi, Blakett Laboratory, Imperial College London Computation of the power spectrum at the end of inflation, study of the inflation as a decoherence process and of the quantum measurement problem. These topics lead me to discuss anthropic reasoning and multiverses physics.
05-07/2011	Evolution of LTB-voids and acceleration of the expansion of the Universe Supervisor : Dr. Mathieu Langer, Institut d'Astrophysique Spatiale (IAS), Orsay Analytical derivation of the Einstein's equations, numerical resolution and application to ISW effect.

List of Publications

Articles published

- E. Bavarsad, C. Stahl, S.P. Kim, S-S. Xue, *Effect of a magnetic field background on Schwinger mechanism in de Sitter spacetime*, Phys.Rev. D **97** (2018) no.2, 025017, <http://arxiv.org/abs/1707.03975>
- R. Moradi, C. Stahl, J. Firouzjaee, S-S. Xue, *Charged cosmological black hole*, Phys. Rev. D **96** (2017) no.10, 104007, <http://arxiv.org/abs/1705.04168>
- E. Bavarsad, C. Stahl S-S. Xue, *Scalar current of created pairs by Schwinger mechanism in de Sitter spacetime*, Phys. Rev. D **94** 104011 (2016), <http://arxiv.org/abs/1602.06556>
- C. Stahl, S-S. Xue, *Schwinger effect, backreaction and magnetogenesis in de Sitter spacetime*, Phys.Lett. B **760** (2016) 288-292, <https://arxiv.org/abs/1603.07166>
- C. Stahl, *Inhomogeneous matter distribution and supernovae*, Int. J. Mod. Phys. D **25**, 1650066, <http://www.worldscientific.com/doi/abs/10.1142/S0218271816500668>.
- C. Stahl, E. Strobel, S-S. Xue, *Fermionic current and Schwinger effect in de Sitter spacetime*, Phys. Rev. D **93** (2016) 2, 025004, <http://arxiv.org/abs/1507.01686>
- B. Bolliet, J. Grain, C. Stahl, L. Linsefors, A. Barrau , *Comparison of primordial tensor power spectra from the deformed algebra and dressed metric approaches in loop quantum cosmology*, Phys. Rev. D **91** 084035 (2015), <http://arxiv.org/abs/1502.02431>

Proceedings

- E. Bavarsad, C. Stahl, S.P. Kim, S-S. Xue, *Schwinger mechanism in electromagnetic field in de Sitter spacetime*, proceeding of IK15.
- R. Ruffini, C. Stahl, *Cosmological fractal matter with an upper cutoff*, proceedings of IK14
- C. Stahl, E. Strobel, S-S. Xue, *Pair creation in the early universe*, <http://arxiv.org/abs/1602.09090>
- C. Stahl, E. Strobel, *Semiclassical fermion pair creation in de Sitter spacetime*, AIP Conf. Proc. **1693** (2015) 050005, <http://arxiv.org/abs/1507.01401>

Articles submitted

- D. Begue, C. Stahl, S-S. Xue, *A model of interacting dark fluids tested with supernovae data*, <http://arxiv.org/abs/1702.03185>

Schools and Conferences

- 15/19-01-2018 **CosmoAndes 2018, Santiago**
Contributed talk : *Charged cosmological black hole.*
- 20/30-06-2016 **Supernovae, Hypernovae and Binary Driven Hypernovae, An Adriatic Workshop, Pescara**
Contributed talk : *Interacting dark energy*
- 25-05-2016 **Crafoord Prize Symposium: Rotating black holes and their astrophysical consequences, Stockholm**
- 07/11-09-2015 **Astrophysical Probes of Fundamental Physics: A PhD School at University of Ferrara**
Contributed talk : *Fractal matter distribution and acceleration of the expansion of the Universe*
- 20/24-07-2015 **14th Italian-Korean Symposium on Relativistic Astrophysics, Pescara**
Contributed talk : *Fractal matter distribution and supernovae IA*
- 12/18-07-2015 **Fourteenth Marcel Grossmann Meeting, Rome**
Contributed talk : *Pair creation in the early Universe*
- 13/18-04-2015 **2nd Cesar Lattes meeting, Rio de Janeiro**
Contributed talk : *Pair creation in the early Universe*
- 11-2014 **ICRANet meeting, Pescara**
- 30-06/04-07-2014 **Black holes : the largest energy sources in the Universe, Erevan**
- 04/06-06-2014 **Chalonge workshop on WDM, Paris**
- 11/16-05-2014 **Supernovae, Gamma-ray bursts and the induced gravitational collapse, Les Houches school on GRB**
- 11/18-08-2011 **International Conference of Physics Students, Budapest**
Contributed talk : *Cosmic acceleration and inhomogeneous universes*
- 18/29-07-2011 **From the infinitely large to the infinitely small, Paris**
Project and talk: *Gravitational waves : Detectability*

Seminars

- 06-04-2018 *Primordial magnetogenesis*
Journal club at Pontifical University of Valparaiso
QED and Schwinger effect in de Sitter spacetime (5 times)
- 27-04-2018 **Joined seminar on cosmology Valparaiso-Santiago**
- 08-12-2017 **Theory journal club at APC, Paris**
- 13-11-2017 **Invited talk, University of Gunsan**
- 04-09-2017 **University of the Bio-Bio, Concepcion**
- 31-08-2017 **Pontifical University of Valparaiso**
Charged cosmological black hole
- 22-11-2017 **Journal club of Ipht, Paris**
Fermionic pair creation and current in de Sitter spacetime
- 12-10-2015 **Nordita High-Energy Physics Theory Seminar, Stockholm**
Magnetic field in the sky
- 10-02-2015 **ICRANet, Pescara**
Primordial nucleosynthesis
- 21-02-2014 **Institut de Physique Nucléaire, Paris**

Popularisation

- 12/2016 **The role of emptiness**
I collaborated with the Italian artist Giovanna Romano on a thinking about emptiness both from the astrophysicist and the artist point of view. Our discussions lead to an artwork.
- 12/2015 **Popularisation for high school students**
In Alsace (France), presentation of cosmology and philosophy for high school students (15 hours).
- 01-04-2014 **Conference in Paris XI, Orsay**
I delivered a conference about the modern cosmology for undergraduate students.
- 11/2013 **Popularisation for the amateur astronomers of the Chevreuse valley (south of Paris) (1 hour)**
Art and General Relativity
- 05/2012 As part of a project with the Northern Kentucky University, I wrote an essay on black holes and their laws. The goal was to explore the complexities of understanding notions that are outside of one's common imagination. Based on this essay, an artwork was born and exposed.

Interest in philosophy

- 2016 **Weekly meetings for Pescara PhD students**
I was the main organizer of the weekly meetings for PhD students in Pescara. We gathered to discuss various topics such as machine learning, multiverses, the game of go.... My talk in one of those meetings was entitled *Simulated reality, dreams and all that*.
- 10/11/2015 **Ach so! cafe, Nice**
Seminar: *Do we live in the matrix?*
- 07/09-10-2015 **The information universe, Groningen**
- 06-05-2015 **ICRANet Lectures 2015, Rome**
Lecturer: *Fine Tuning for Life*
- 24-06/12-07-2013 **UCSC Institute for the Philosophy of Cosmology**
Santa Cruz, California
After selection, I received a grant of 3000 \$ to study fundamental questions such as philosophical foundation of statistical mechanics, quantum physics, and relativity, the time arrow, the ontic or emergent nature of space-time, reasons to believe in multiverses, anthropic reasoning, the metaphysics of law and chance.

Skills and interests

Computer skills:

Operating systems: Linux, Windows

Programming Languages: Mathematica

Hobbies chess (tournaments player), trumpet (jazz, classical), caving

Languages:

French Mother tongue

English Fluent

German Conversational

Italian Conversational

Spanish Conversational

Swedish Basics