

## Clément Stahl

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Born 23 June 1990  
Nationality : French

## Summary

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I am a theoretical physicist interested in cosmology. My current focus of research are: (1) Perturbation theory in different cosmological models (2) Impact of the presence of electromagnetic fields during inflation (3) Non-gaussianities generation and detection. Using techniques from General Relativity and Field theory, I am developing innovative models to do fundamental physics with large scale structures observables.

## Education

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2013-2017	<b>PhD in Theoretical Cosmology</b> 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)
2008-2013	<b>Diploma in Theoretical Physics</b> University Paris XI, Orsay, France Speciality: Cosmology Grade: "Bien" One year of Erasmus exchange in Imperial College, London

## Professional history

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2017-present	<b>Postdoctoral fellow in Theoretical Cosmology</b> Pontificia Universidad Catolica de Valparaíso, Chile
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## Seminars (11)

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06-04-2018	<i>Primordial magnetogenesis</i> Journal club at Pontifical University of <b>Valparaíso</b> <i>QED and Schwinger effect in de Sitter spacetime</i> (5 times)
27-04-2018	Joined seminar on cosmology <b>Valparaíso-Santiago</b>
08-12-2017	Theory journal club at APC, <b>Paris</b>
13-11-2017	<b>Invited talk</b> , University of <b>Gunsan</b>
04-09-2017	University of the Bio-Bio, <b>Concepcion</b>
31-08-2017	Pontifical University of <b>Valparaíso</b> <i>Charged cosmological black hole</i> (2 times)
07-02-2018	<b>La Plata</b>
22-11-2017	Journal club of Ipht, <b>Paris</b> <i>Fermionic pair creation and current in de Sitter spacetime</i>
12-10-2015	Nordita High-Energy Physics Theory Seminar, <b>Stockholm</b> <i>Magnetic field in the sky</i>
10-02-2015	ICRANet, <b>Pescara</b> <i>Primordial nucleosynthesis</i>
21-02-2014	Institut de Physique Nucléaire, <b>Paris</b>

## List of Publications

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### Articles published (7)

- 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 (4)

- 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 (3)

- L. Castiblanco, R. Gannouji, J. Noreña and C. Stahl, *Relativistic cosmological large scale structures at one-loop*, <https://arxiv.org/abs/1811.05452>.
- C. Stahl *Schwinger effect impacting primordial magnetogenesis*, <https://arxiv.org/abs/1806.06692>
- 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 (16)

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- 29-10/02-11 2018 2nd Workshop on Current Challenges in Cosmology : LSS, Dark Energy and Modified Gravity, **Bogota**.
- 01/07-07-2018 Fifteenth Marcel Grossmann Meeting, **Rome**  
Contributed talk : *Schwinger effect impacting primordial magnetogenesis and Relativistic correction to large scale structure formation*
- 22/23-06-2018 Perspective 4, **Paris** , workshop on the professional insertion (in and outside academia) in France for the PhDs.
- 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**
- 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*

## Popularisation

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- 03-10-2018 **Cosmology and formation of structures**  
Colloquium of popularisation opened for undergraduated students, Valparaiso.
- 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)**
- 05/2012 **Art and General Relativity**  
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

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- 2016 **Weekly meetings for Pescara PhD students**  
I organized 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.

## Professional activities

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- 2018 I'm in charge of the organization of the journal club in my institute in Valparaiso. It consists in a weekly meeting where a researcher discuss the scientific actualities.
- 07-2018 I co-chaired one parallel session of the Marcel Grossmann meeting in Rome entitled "Dark Energy and Large Scale structure".

## Skills and interests

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### Computing and Editing

Mathematica, Python, C/C++, LaTeX, HTML

**Hobbies** chess (tournaments player), trumpet (jazz, classical), cooking

### Languages:

**French** Monther tongue

**English** Fluent

**German** Conversational

**Italian** Conversational

**Spanish** Conversational

**Swedish** Basics