

Pascal Grange

Xi'An Jiaotong-Liverpool University, 111 Ren'ai Rd, 215123 Suzhou, Jiangsu, China

E-mail: pascal.grange@polytechnique.org

Phone: +1 516 367 5007

French and Swiss citizenships

PROFESSIONAL EXPERIENCE

01/2014–: **Xi'An Jiaotong-Liverpool University**, Suzhou.

Lecturer, Department of Mathematical Sciences.

Honorary lecturer, University of Liverpool.

Courses taught: quantum mechanics, tensor algebra.

2009–2013 : **Cold Spring Harbor Laboratory**. Computational postdoc.

PIs: Partha P. Mitra and Michael Hawrylycz (Allen Institute).

- Developed software to analyze gene-expression data (Allen Brain Atlas).

- Performed statistical analysis of brain-wide expression profiles of genes related to autism and addiction.

2008–2009: **Goldman Sachs**, London. Associate strategist (Foreign Exchange).

Implemented new copula models for the pricing of exotic options.

2006–2008: **University of Hamburg**. Postdoc at the Zentrum für mathematische

Physik. Published work on mirror symmetry with magnetic fluxes.

2005–2006: **Institute for Advanced Study**, Princeton.

Member, School of Natural Sciences.

Published work on phase transitions in string theory.

EDUCATION AND TRAINING

2002–2005: **École polytechnique**, Paris.

PhD in theoretical physics, with highest honors.

Thesis: *D-branes, effective actions and mirror symmetry*.

2001–2002: **CERN Theory Division**, Geneva. One-year internship.

2000–2001: **Université Paris 7**. M.S. in mathematics, with honors.

2000–2003: **École des ponts**, Paris. Degree in mathematical engineering.

1997–2000: **École polytechnique**, Paris. Degree in engineering.

Majoring in physics, minoring in mathematics.

HONORS AND RESPONSIBILITIES

- **L.E. Rivot Prize** awarded in 2000 by the **Académie des sciences**, Paris (four prizes awarded annually for undergraduate excellence at École polytechnique).
- Refereed papers for the **Journal of High Energy Physics**, **Frontiers in Neuroscience**, **PLoS Computational Biology**.

PUBLICATIONS AND PREPRINTS

Computational neuroscience

- P. Grange, I. Menashe and M. Hawrylycz, *Cell-type-specific neuroanatomy of brain-wide expression of autism-related genes*, submitted, [arXiv:1408.2463 [q-bio.NC]].
- P. Grange, J.W. Bohland, B.W. Okaty, K. Sugino, H. Bokil, S.B. Nelson, L. Ng, M. Hawrylycz and P.P. Mitra, *Cell-typebased model explaining coexpression patterns of genes in the brain*, PNAS 2014 111 (14) 5397–5402.
- I. Menashe, P. Grange, E.C. Larsen, S. Banerjee-Basu and P.P. Mitra, *Co-expression profiling of autism genes in the mouse brain*. PLoS computational biology, 9(7), e1003128.
- P. Grange, M. Hawrylycz and P.P. Mitra, *Computational neuroanatomy and co-expression of genes in the adult mouse brain, analysis tools for the Allen Brain Atlas*, Quantitative Biology 2013, **1**(1): 91–100, [arXiv:1301.1730 [q-bio.QM]].
- P. Grange and P.P. Mitra, *Computational neuroanatomy and gene expression: optimal sets of marker genes for brain regions*, in IEEE, 46th Annual Conference on Information Sciences and Systems, Princeton 2012, [arXiv:1205.2721 [q-bio.QM]].

Theoretical high-energy physics

- P. Grange and S. Schäfer-Nameki, *Towards mirror symmetry à la SYZ for generalized Calabi–Yau manifolds*, JHEP **0710**, 052 (2007), [arXiv:0708.2392 [hep-th]].
- P. Grange and S. Schäfer-Nameki, *Noncommutativity, T-folds and $G \times G$ structure*, Nucl. Phys. **B770**, 123 (2007), [arXiv:hep-th/0609084].
- P. Grange and R. Minasian, *Tachyon condensation and D-branes in generalized geometries*, Nucl. Phys. **B741**, 199 (2006), [arXiv:hep-th/0512185].
- P. Grange and R. Minasian, *Modified pure spinors and mirror symmetry*, Nucl. Phys. **B732**, 366 (2006), [arXiv:hep-th/0412086].
- P. Grange, *Tachyon potential in a magnetic field with anomalous dimensions*, JHEP **0506**, 018 (2005), [arXiv:hep-th/0410180].
- P. Grange, *Deformation of p-adic amplitudes in a magnetic field*, Phys. Lett. **B616**, 135 (2005), [arXiv:hep-th/0409305].
- P. Grange, *Branes as stable holomorphic line bundles on the noncommutative torus*, JHEP **0410**, 002 (2004), [arXiv:hep-th/0403126].
- P. Grange, *Modified star-products beyond the large-B limit*, Phys. Lett. **B586**, 125 (2004), [arXiv:hep-th/0304059].
- P. Grange, *Derivative corrections from boundary state computations*, Nucl. Phys. **B649**, 297 (2003), [arXiv:hep-th/0207211].

SOFTWARE

Brain Gene Expression Analysis, MATLAB toolbox (analysis of brain-wide gene-expression data), available at <http://brainarchitecture.org/allen-atlas-brain-toolbox>

MAIN CONFERENCES AND PRESENTATIONS

- 2014:** **Analyzing Brainomics** (workshop of NIPS, Neural Information Processing Systems), Montreal.
Accepted oral presentation: *Region-specificity of cell types in the mouse brain.*
- 2012:** – **Neuroscience 2012**, New Orleans.
Poster (first author), with J.W. Bohland, M. Hawrylycz and P.P. Mitra, *A software suite for multivariate analysis of brain-wide gene-expression.*
– **Neuroinformatics 2011**, Marine Biological Laboratory, Woods Hole.
Lecture: *Analysis of brain-wide gene-expression data.*
– **46th Conference on Information Sciences and Systems**, Princeton.
Invited talk: *Computational neuroanatomy and gene expression.*
- 2011:** – **Neuroscience 2011**, Washington, D.C.
Poster (first author), with B. Okaty, K. Sugino, S. Nelson, M. Hawrylycz and P.P. Mitra: *Distribution of cell types in the mouse brain from the Anatomic Gene Expression Atlas.*
– **Circuits and connectivity in the vertebrate brain**, Cold Spring Harbor.
Lecture: *Computational methods for neuroanatomy.*
– **Network architecture of brain structures**, KITP, Santa Barbara.
Talk: *The Allen Gene Expression Atlas and neuronal cell types.*
– **Neuroinformatics 2011**, Marine Biological Laboratory, Woods Hole.
- 2010:** **Neuroscience 2010**, San Diego. Two posters (first author):
– with P.P. Mitra, *Marker genes and the anatomy of the mouse brain*,
– with M. Henkelman and P.P. Mitra, *Computer-guided stereotactic injections.*
- 2007:** – **Workshop on Poisson geometry**, Erwin Schrödinger Institut, Vienna.
Talk: *Magnetic fluxes and generalized geometry.*
– **DESY**, Hamburg. *Workshop on flux compactifications.*
Talk: *Nongeometric backgrounds.*
- 2006:** – **Institute for Advanced Study**, Princeton.
Seminar: *Tachyon condensation and generalized spaces.*
- 2004:** – **Caltech, Duke and Upenn**: talks on mirror symmetry with magnetic fluxes.
– **Prospects in theoretical physics**, IAS, Princeton. Summer school.
– **Random matrices in physics**, Les Houches. Summer school.
– **Institut Henri Poincaré**, Paris. Talk: *Noncommutativity and stable bundles.*
- 2003:** – **XIIth Meeting on geometry, topology and physics**, University of Oporto. Talk: *Noncommutativity in D-brane effective actions.*
– **Frontiers in number theory, geometry and physics**, Les Houches.
Winter school.

ADDITIONAL INFORMATION

- **Computing:** Matlab, C++.
- **Languages:** French (mother tongue), English, German, elementary Mandarin Chinese.
- **Extra-scientific interests:** middle and long-distance running (2009 Paris Marathon finisher), collecting Chinese scholar's objects of the Ming and Qing dynasties.