

Pascal Grange

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French and Swiss citizenships

PROFESSIONAL EXPERIENCE

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

Lecturer 5, Department of Mathematical Sciences.

Honorary lecturer, University of Liverpool.

Module leader: Quantum Mechanics (MTH311), Cartesian Tensors (MTH308).

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).

- Analyzed brain-wide expression profiles of genes related to autism and addiction.

2008–2009: Goldman Sachs, London. Associate strategist.

Priced options and monitored risks.

2006–2008: University of Hamburg, Zentrum für mathematische Physik.

Postdoctoral fellow.

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**, **Bioinformatics**.

PUBLICATIONS

• Quantitative biology

1. M. Hawrylycz *et al.*, *Canonical genetic signatures of the adult human brain*, Nature Neuroscience (2015) **18** (12) 1832–44.
2. P. Grange, I. Menashe and M. Hawrylycz, *Cell-type-specific neuroanatomy of cliques of autism-related genes in the mouse brain*, Frontiers in Computational Neuroscience **9**, 55.
3. 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.
4. 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.
5. 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]].
6. 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

1. 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]].
2. P. Grange and S. Schäfer-Nameki, *Noncommutativity, T-folds and $G \times G$ structure*, Nucl. Phys. **B770**, 123 (2007), [arXiv:hep-th/0609084].
3. P. Grange and R. Minasian, *Tachyon condensation and D-branes in generalized geometries*, Nucl. Phys. **B741**, 199 (2006), [arXiv:hep-th/0512185].
4. P. Grange and R. Minasian, *Modified pure spinors and mirror symmetry*, Nucl. Phys. **B732**, 366 (2006), [arXiv:hep-th/0412086].
5. P. Grange, *Tachyon potential in a magnetic field with anomalous dimensions*, JHEP **0506**, 018 (2005), [arXiv:hep-th/0410180].
6. P. Grange, *Deformation of p-adic amplitudes in a magnetic field*, Phys. Lett. **B616**, 135 (2005), [arXiv:hep-th/0409305].
7. P. Grange, *Branes as stable holomorphic line bundles on the noncommutative torus*, JHEP **0410**, 002 (2004), [arXiv:hep-th/0403126].
8. P. Grange, *Modified star-products beyond the large- B limit*, Phys. Lett. **B586**, 125 (2004), [arXiv:hep-th/0304059].
9. 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), see pjgrange.github.io for download instructions and manual.

MAIN CONFERENCES AND PRESENTATIONS

- 2016:** **Genomics of Brain Disorders**, Wellcome Genome Campus Cambridge.
Poster: *Cell-type-specificity of brain-wide expression profiles of cliques of autism-related genes.*
- 2014:** **Analyzing Brainomics (workshop of NIPS, Neural Information Processing Systems)**, Montreal.
Oral presentation: *Region-specificity of cell types in the mouse brain.*
- 2012:** – **Neuroscience 2012**, New Orleans.
Poster: *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: *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:
– *Marker genes and the anatomy of the mouse brain,*
– *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.