Matthieu Wyart
Institute for Theoretical Physics
École Polytechnique Fédérale de Lausanne
matthieu.wyart@epfl.ch

Curriculum Vitae

Matthieu Wyart

Personal data

- **Place and date of birth**: Paris (France), May 24th, 1978.
- **Citizenship**: French
- **Work address**:
  Institute of Physics
  Ecole Polytechnique Federale de Lausanne
  BSP UNIL office 729, 1015 Lausanne, Switzerland

Research Interests

- Soft condensed-matter, glass transition, granular matter, biophysics, neuroscience, machine learning, econophysics

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Education

1998-2001 • **Degree in Physics** obtained with Honors at the Ecole Polytechnique, Paris. Speciality in Physics, Mathematics and Economics.

2001-2002 • **Diploma of Advanced Studies in Theoretical Physics** obtained with highest Honors at the Ecole Normale Superieure, Paris.

2002-2005 • **Ph.D. in theoretical Physics and Finance** at the SPEC, CEA Saclay, Paris, co-advised by J.P. Bouchaud and M. Mezard. Studies of the electronic markets.

Employment

2005 • **Analyst** in the research department of Capital Fund Management.

2005-2008 • **George Carrier Fellow** at Harvard, School of Engineering and Applied Sciences

2008-2009 • **Research Specialist** at Janelia Farm, HHMI

2009-2010 • **Visiting Research Specialist** at the Lewis-Sigler Institute, Princeton

Employment (continued)

2010-2014 • **Assistant Professor** at New York University, Physics Department

2014-2015 • **Associate Professor** at New York University, Physics Department

2015-Present • **Associate Professor** at Ecole Polytechnique Federale de Lausanne, Institute for Theoretical Physics

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Awards and Honors

- **Visiting Professor**, IUSTI, Marseille University, July 2015, July 2017.
- **Recipient of the Simons Investigator Award 2015**, attributed by the Simons Foundation to "outstanding scientists establishing creative new directions".
- **Visiting Professor**, Ecole Normale Superieure, Paris, June 2015.
- **Chaire Joliot**, attributed as Visiting Professor by the Ecole de Physique et Chimie, Paris, June and Fall 2013.
- **Recipient of the Sloan Fellowship 2011**, attributed to "scholars who demonstrate outstanding promise and potential in their field".
- **Inaugural Recipient of the George Carrier Fellowship**, attributed by Harvard, School of Engineering and Applied Sciences. The G. Carrier Fellowship was started in 2005 to honor the memory of Prof. G. Carrier, who worked on Applied Mathematics broadly. The Fellowship is awarded to outstanding applicants interested in an opportunity for independent research that reflects the spirit of George Carrier's approach.
- **Diploma received with Highest Honors** Ecole Normale Superieur, 2002, attributed to a single student that year.
- **Award for Excellence in Ph.D Research**, attributed by the Ecole Polytechnique to 10% of its Ph.D's.

Publications

- 76 **Asymptotic learning curves of kernel methods: empirical data v.s. Teacher-Student paradigm** Mario Geiger, Stefano Spigler, Matthieu Wyart, arXiv:1905.10843
- 75 **How collective asperity detachments nucleate slip at frictional interfaces** Tom de Geus, Marko Popovic, Wencheng Ji, Alberto Rosso, Matthieu Wyart, arXiv:1904.07635
- 74 **Interparticle friction leads to non-monotonic flow curves and hysteresis in viscous suspensions** Hugo Perrin, Cecile Clavaud, Matthieu Wyart, Bloen Metzger, Yoel Forterre, arXiv:1904.03918
- 73 **Scaling description of generalization with number of parameters in deep learning** Mario Geiger, Arthur Jacot, Stefano Spigler, Frank Gabriel, Levent Sagun, Stephane d'Ascoli, Giulio Biroli, Clement Hongler, Matthieu Wyart, arXiv:1901.01608
- 72 **Direct Coupling Analysis of Epistasis in Allosteric Materials** Barbara Bravi, Riccardo Ravasio, Carolina Brito, Matthieu Wyart, arXiv:1811.10480
- 71 **A jamming transition from under-to over-parametrization affects loss landscape and generalization** Stephano Spigler, Mario Geiger, Stephane d'Ascoli, Levent Sagun, Giulio Biroli, Matthieu Wyart, arXiv:1810.09665
- 70 **The jamming transition as a paradigm to understand the loss landscape of deep neural networks** Mario Geiger, Stephano Spigler, Stephane d'Ascoli, Levent Sagun, Marko Baity-Jesi, Giulio Biroli, Matthieu Wyart, arXiv:1809.09349

Publications (continued)

- 71 **Allostery in Its Many Disguises: From Theory to Applications** Shoshana Wodak et al. Structure, **27**, 566 (2019)

- 68 **Theory for the density of interacting quasi-localised modes in amorphous solids** Wencheng Ji, Marko Popovic, Tom de Geus, Edan Lerner, Matthieu Wyart, Physical Review, E **99** (2), 02300 (2019)

- 67 **Fast generation of ultrastable computer glasses by minimization of an augmented potential energy** Geert Kapteijns, Wencheng Ji, Carolina Brito, Matthieu Wyart, Edan Lerner, Physical Review, E **99** (1), 012106 (2019)

- 66 **Spatial structure of quasi-localized vibrations in nearly jammed amorphous solids** Masanari Shimada, Hideyuki Mizuno, Matthieu Wyart, Atsushi Ikeda, Physical Review E **98**, 060901 (2018)

- 65 **Universality of jamming of non-spherical particles** Carolina Brito, Harukini Ikeda, Pierfrancesco Urbani, Matthieu Wyart, Francesco Zamponi, PNAS, **115** (46), 11736-11741 (2018)

- 64 **Theory for swap acceleration near the glass and jamming transitions for continuously polydisperse particles** Carolina Brito, Edan Lerner, Matthieu Wyart, Physical Review X **8**, 031050 (2018)

- 63 **Shear fronts in shear-thickening suspensions** Endao Han, Matthieu Wyart, Ivo Peters, Heinrich Jaeger, Physical Review Fluids **3**, 073301 (2018)

- 63 **Principles for optimal cooperativity in allosteric materials** Le Yan, Riccardo Ravasio, Carolina Brito, Matthieu Wyart, Biophysical Journal **114**, 2787-2798 (2018)

- 62 **Elastoplastic description of sudden failure in athermal amorphous materials during quasistatic loading** Marko Popovic, Tom de Geus, Matthieu Wyart, Phys. Rev. E **98**, 040901 (2018)

- 61 **Comparing dynamics: Deep neural networks versus glassy systems** Marco Baity-Jesi, Levent Sagun, Mario Geiger, Stephano Spigler, Gerard Ben Arous, Chiar Cammarota, Yann Lecun, Matthieu Wyart and Giulio Biroli, Proceedings of the 35th International Conference on Machine Learning, Stockholm, Sweden, PMLR **80** (2018)

- 60 **Microscopic processes controlling the Herschel-Bulkley exponent** Jie Lin and Matthieu Wyart, Phys. Rev. E **97**, 012603 (2018)

- 59 **Does a growing static length scale control the glass transition?** Matthieu Wyart and Mike Cates, Phys. Rev. Lett., **119**, 195501 (2017)

- 58 **Friction law and hysteresis in granular materials** Eric DeGiuli and Matthieu Wyart, PNAS **114**, 9284 (2017)

- 57 **Architecture and coevolution of allosteric materials** Le Yan, Riccardo Ravasio, Carolina Brito and Matthieu Wyart, PNAS, **114**, 2526 (2017)

- 56 **Effect of friction on dense suspension flows of hard particles** Martin Trulsson, Eric DeGiuli and Matthieu Wyart, Phys. Rev. E **95**, 012605. (2017)

- 55 **Unifying Suspension and Granular flows near Jamming** Eric DeGiuli and Matthieu Wyart, EPJ **140**, 01003 (2017)

- 54 **Edge mode amplification in disordered elastic networks** Le Yan, Jean-Philippe Bouchaud and Matthieu Wyart, Soft Matter **13**, 5795-5801 (2017)

- 53 **Scaling description of non-local rheology** Thomas Gueudré, Jie Lin, Alberto Rosso and Matthieu Wyart, Soft Matter **13**, 3794-3801 (2017)

- 52 **Evidence for marginal stability in emulsions** Jie Lin, Ivan Jorjadze, Lea-Leaticia Pontani, Matthieu Wyart and Jasna Brujic, Phys. Rev. lett., **117**, 208001 (2016)

- 51 **Scale-free channeling patterns near the onset of erosion of sheared granular beds** Pascale Aussillous, Zenhai Zou, Elisabeth Guazzelli, Le Yan and Matthieu Wyart, PNAS **113**, 09023 (2016)

- 50 **Unsteady flow and particle migration in dense, non-Brownian suspensions** Michiel Hermes, Ben Guy, Wilson Poon, Guilhem Poy, Mike Cates and Matthieu Wyart, Jour. of Rheol. **60**, 905-916 (2016)

Publications (continued)

- 49 **Effect of particle collisions in dense suspension flows** Gustavo During, Edan Lerner and Matthieu Wyart, Phys. Rev. E **94**, 022601 (2016)

- 48 **Phase diagram for inertial granular flows** Eric DeGiuli, Jim McElwaine, Matthieu Wyart, Phys. Rev. E **94**, 012904 (2016)

- 47 **On variational arguments for vibrational modes near jamming** Le Yan, Eric DeGiuli and Matthieu Wyart, Euro. Lett. **114**, 26003 (2016)

- 46 **Mean-field description of plasticity in disordered solids** Jie Lin and Matthieu Wyart, Phys. Rev. X, **6**, 011005 (2016)

- 45 **Adaptive elastic networks as models of supercooled liquids** Le Yan and Matthieu Wyart, Phys. Rev. E **92**, 022310, (2015)

- 44 **A model for the erosion onset of a granular bed sheared by a viscous fluid** Le Yan, Antoine Barizien and Matthieu Wyart, Phys. Rev. E., **93**, 012903 (2015)

- 43 **Criticality in the approach to failure in granular materials and amorphous solids** Jie Lin, Thomas Gueudre, Alberto Rosso and Matthieu Wyart, Phys. Rev. Lett., **114**, 168001 (2015)

- 42 **Theory of the jamming transition at finite temperature** Eric DeGiuli, Edan Lerner and Matthieu Wyart, Jour. of Chem. Phys., **142**, 164503 (2015)

- 41 **Dynamics and Correlations among Soft Excitations in Marginally Stable Glasses** Le Yan, Marco Baity-Jesi, Markus Mueller and Matthieu Wyart, Phys. Rev. Lett. **114**, 247208, (2015)

- 40 **Unified Theory of Inertial Granular Flows and Non-Brownian Suspensions** Eric DeGiuli, Gustavo During, Edan Lerner and Matthieu Wyart, Phys. Rev. E **91**, 062206 (2015)

- 39 **Evolution of covalent networks under cooling: contrasting the rigidity window and jamming scenarios** Le Yan and Matthieu Wyart, Phys. Rev. Lett. **113**, 215504 (2014)

- 38 **The distribution of forces affects vibrational properties in hard sphere glasses** Eric DeGiuli, Edan Lerner, Carolina Brito and Matthieu Wyart, PNAS **111**, 17054-17059 (2014)

- 37 **Scaling description of the yielding transition in soft amorphous solids at zero temperature** Jie Lin, Edan Lerner, Alberto Rosso and Matthieu Wyart, PNAS **111**, 14382-14387 (2014)

- 36 **Marginal Stability in Structural, Spin and Electron Glasses** Markus Muller and Matthieu Wyart, Annual Review of Condensed Matter Physics, **6**,1 (2014)

- 35 **Granulation and bistability in non-Brownian suspensions** Mike Cates and Matthieu Wyart, Rheologica Acta, **53**, 755-764 (2014)

- 34 **Effects of coordination and pressure on sound attenuation, boson peak and elasticity in amorphous solids** Eric DeGiuli, Arnaud Laversanne-Finot, Gustavo During, Edan Lerner, Matthieu Wyart, Soft Matter, **10**, 5628-5644 (2014)

- 33 **Breakdown of continuum elasticity in amorphous solids** Edan Lerner, Eric DeGiuli, Gustavo During, Matthieu Wyart, Soft Matter, **10**, 5085-5092 (2014)

- 32 **Discontinuous shear thickening without inertia in dense non-Brownian suspensions** Matthieu Wyart and Mike Cates, Phys. Rev. Lett. **1**12, 098302 (2014)

- 31 **Length scales and self-organization in dense suspension flows** Gustavo During, Edan Lerner and Matthieu Wyart, Phys. Rev. E., **8**9, 022305 (2014)

- 30 **On the density of shear transformation zones in amorphous solids** Jie Lin, Alaa Saade, Edan Lerner, Alberto Rosso and Matthieu Wyart, Euro. Phys. Lett., **1**05, 26003 (2014)

Publications (continued)

- 29 **Low-energy non-linear excitations in sphere packings** Edan Lerner, Gustavo During, Matthieu Wyart, Soft Matter, 2013, **9** 8252 - 8263 (2013)

- 28 **Why glass elasticity affects the thermodynamics and fragility of super-cooled liquids** Le Yan, Gustavo During, Matthieu Wyart, PNAS, **1**10, 6307-6312 (2013)

- 27 **Phonon gap and localization lengths in floppy materials** Gustavo During, Edan Lerner, Matthieu Wyart, Soft Matter, **9**, 146-154 (2013)

- 26 **Simulations of driven overdamped frictionless hard spheres** Edan Lerner, Gustavo During, Matthieu Wyart, Computer Physics Communications, **1**84, 628 (2013)

- 25 **Marginal Stability Constrains Force and Pair Distributions at Random Close Packing** Matthieu Wyart, Physical Review Letters, **1**09, 125502 (2012)

- 24 **Toward a microscopic description of flow near the jamming threshold** Edan Lerner, Gustavo During, Matthieu Wyart, Europhysics Letters, **9**9, 58003 (2012)

- 23 **A unified framework for dense suspension flows and soft amorphous solids** Edan Lerner, Gustavo During, Matthieu Wyart, PNAS, **1**09, 4798-4803 (2012)

- 22 **Proprioceptive Coupling within Motor Neurons Drives C. elegans Forward Locomotion** Wen Q, Po MD, Hulme E, Chen S, Liu X, Kwok SW, Gershow M, Leifer AM, Butler V, Fang-Yen C, Kawano T, Schafer WR, Whitesides G, Wyart M, Chklovskii DB, Zhen M, Samuel AD, Neuron **7**6, 750 (2012)

- 21 **Curling instability induced by swelling** Stephane Douezan, Matthieu Wyart, Francoise Brochard-Wyart and Damien Cuvelier, Soft Matter, **7**, 1506-1511 (2011)

- 20 **Evaluating Gene Expression Dynamics Using Pairwise RNA FISH Data** Matthieu Wyart, David Botstein, Ned Wingreen, Plos Computational Biology, **6**, e1000979 (2010)

- 19 **Biomechanical analysis of gait adaptation in the nematode Caenorhabditis elegans** Chris Fang-Yen*, Matthieu Wyart*, Julie Xie, Risa Kawai, Tom Kodger, Sway Chen, Quan Wen, Aravi Samuel, PNAS, **1**07, 20323-20328 (2010)

- 18 **Correlations between vibrational entropy and dynamics in super-cooled liquids** Matthieu Wyart, Physical Review Letters, **1**04, 095901 (2010)

- 17 **Scaling of phononic transport with connectivity in amorphous solids** Matthieu Wyart, Europhysics Letters, **8**9, 64001, (2010)

- 16 **Heat transport in model jammed solids** Vincenzo Vitelli, Ning Xu, Matthieu Wyart, Andrea J. Liu, Sidney R. Nagel, Physical Review E **8**1, 021301 (2010)

- 15 **Geometric interpretation of pre-vitrification in hard sphere liquids** Carolina Brito and Matthieu Wyart, Journal of Chemical Physics **1**31, 024504, (2009)

- 14 **On the dependence of the avalanche angle on the granular layer thickness** Matthieu Wyart, Europhysics Letters, **8**5, 24003, (2009)

- 13 **Energy transport in Jammed sphere Packings** Ning Xu, Vincenzo Vitelli, Matthieu Wyart, Andrea Liu and Sidney Nagel, Physical Review Letters, **1**02, 038001, (2009)

- 12 **Elasticity of Floppy and Stiff Random Networks** Matthieu Wyart, Haiyi Liang, Alexandre Kabla and L. Mahadevan, Physical Review Letters, **1**01, 215501, (2008)

- 11 **Relation between Bid-Ask Spread, Impact and Volatility in Double Auction Markets** Matthieu Wyart, Jean-Philippe Bouchaud, Julien Kockelkoren, Marc Potters, Michele Vettorazzo, Quantitative finance, **8**, 41-57, (2008)

- 10 **Self-referential behaviour, overreaction and conventions in financial markets** Matthieu Wyart, Jean-Philippe Bouchaud, Journal of Economical and Behavioral Organization, **6**3 1-24, (2007)

Publications (continued)

- 9 **Heterogeneous Dynamics, Marginal Stability and Soft Modes in Hard Sphere Glasses** Carolina Brito and Matthieu Wyart, Journal of Statistical Mechanics, **0**8, 1742-5468 (2007)

- 8 **Excess vibrational modes and the boson peak in model glasses** Ning Xu, Matthieu Wyart, Andrea J. Liu, Sidney R. Nagel, Phys. Rev. Lett, **9**8, 175502 (2007)

- 7 **What makes a hard sphere glass rigid?** Carolina Brito and Matthieu Wyart, Euro. Phys. Letters, **7**6, 149-155, (2006)

- 6 **On the Rigidity of Amorphous solids** Matthieu Wyart, Ann. Phys. Fr., **3**0, pp. 1-96, (2005)

- 5 **Effects of compression on the vibrational modes of marginally jammed solids** Matthieu Wyart, Leo Silbert, S.R. Nagel, Tom Witten, Phys. Rev. E, 72, 051306 (2005)

- 4 **Geometric origin of excess soft vibrational modes in amorphous solids** Matthieu Wyart, S.R. Nagel, Tom Witten, Euro. Phys. Letters, 72, 486-492 (2005)

- 3 **Dynamical susceptibility of glass formers: Contrasting the predictions of theoretical scenarios** Cristina Toninelli, Matthieu Wyart, Gulio Biroli, Ludovic Berthier, J-P Bouchaud, Phys. Rev. E 71, 041505 (2005)

- 2 **Fluctuations and response in financial markets: the subtle nature of 'random' price changes** Jean-Philippe Bouchaud, Yuval Gefen, Marc Potters, and Matthieu Wyart *Quantitative Finance* **4** 176-190 (2004)

- 1 **Statistical models for company growth** Matthieu Wyart, Jean-Philippe Bouchaud *Physica A* **3**26, Issues 1-2, Pages 241-255, (2003)

- *: authors contributed equally

Book Chapters

- **The jamming scenario– an introduction and outlook** Andrea J. Liu, Sidney R. Nagel, Wim van Saarloos, Matthieu Wyart, in "Dynamical heterogeneities in glasses, colloids, and granular media", edited by L. Berthier, G. Biroli, J-P Bouchaud, L. Cipeletti and W. van Saarloos, Oxford University Press, Oxford (2010) p. 298-336

- **Elasticity of soft particles and colloids near Random Close Packing** Matthieu Wyart, in " Microgels: Synthesis, Properties and Applications", edited by A. Fernandez, J. Mattsson, H.M. Wyss, D.A. Weitz, Wiley & Sons, Weinheim (2011) p. 195-206

- **Rigidity-based approach to the boson peak in amorphous solids: from sphere packing to amorphous silica** Matthieu Wyart, in "Rigidity and Boolchand Intermediate Phases in Nanomaterials", M. Micoulaut, M. Popescu Eds. (INOE Bucarest, 2009) p. 159-177

Invited talks at International Conferences

- **Phase transitions in machine learning** Invited speaker, StatPhys meeting, (July 2019)

- **Analogies between failure in amorphous solids and slip at a frictional interface** Invited speaker, Satellite conference of the StatPhys meeting, (July 2019)

- **Protein allostery: mechanics and Inference** Invited speaker, CECAM meeting on co-evolution methods for protein structure and function, (June 2019)

- **Phase transition in deep learning** Invited speaker, MECO44 Key Challenges in Statistical Physics, (May 2019)

Invited talks at International Conferences (continued)

- **Large width limit in deep learning** Invited speaker, Artificial Intelligence and Physics, Institut Pascal, Saclay (March 2019)
- **Phase transition in deep learning** Invited speaker, APS March meeting, Boston (March 2019)
- **Microscopic views on solid friction** Invited speaker, CECAM meeting on computational tribology, Lausanne (January 2019)
- **Jamming and generalisation in deep learning** Invited speaker, Rough Landscapes: From Physics to Algorithms, KITP (January 2019)
- **Landscape of deep learning** Invited speaker, Physique de la cellule au tissu, La-Chapelle Gauthier (October 2018)
- **Landscape of deep learning** Invited speaker, Theoretical Challenges in Partition Functions, Bernouilli center, Lausanne (October 2018)
- **Jamming in Machine learning** Invited speaker, Meeting on small fluctuations in complex systems, Venice (October 2018)
- **Mechanics of allostery** Invited speaker, Annual Technical meeting Society of Engineering Science, Madrid (October 2018)
- **Swap algorithms** Invited speaker, Disordered serendipity: a glassy path to discovery, Rome (September 2018)
- **Biophysics of Allostery** Invited speaker, French Physical Society, Grenoble (August 2018)
- **Hysteresis in Granular materials** Invited speaker, Gordon Conference, USA (July 2018)
- **Swap algorithms: a challenge to theories of the glass transition** Invited speaker, Unifying Concepts in Glassy Physics, Bristol (June 2018)
- **Brittleness in amorphous materials** Invited speaker, MRS Spring meeting, Phoenix (April 2018)
- **Yielding: an overview** Invited speaker, Solving the glass problem, Simons fundation New-York (March 2018)
- **Hysteresis in granular materials** Invited speaker, Non-linear Mechanics and Rheology of Dense Suspensions: Nanoscale Structure to Macroscopic Behavior KITP, USA (January 2018)
- **Evolution of Allostery** Invited speaker, Computational approaches to investigating allostery, CECAM (November 2017)
- **Allostery** Invited speaker, Swiss Physical Society, Geneva (August 2017)
- **Suspensions and Granular Flows** Invited speaker, Powders and Grains, Montpellier (July 2017)
- **Yielding transition** Invited speaker, Material Theories, Oberwolfach (July 2017)
- **Erosion and vortex depinning** Invited speaker, Ordered is Different: New Forms of Organization in Soft Matter Physics, Les Houches (May 2017)
- **Levy-Flight and Yielding** Invited speaker, Dynamics in Glass-forming Liquids, Copenhagen (April 2017)
- **Evolution of allosteric materials** Invited speaker, Journées de Physique Statistique, ESPCI, Paris (January 2017)
- **In-silico allosteric materials** Invited speaker, Topological Meta-materials, Aspen, Colorado (January 2017)
- **Allostery and marginal stability** Invited speaker, Recent Advances on the Glass and Jamming Transitions, CECAM, Lausanne (December 2016)
- **Allostery** Invited speaker, Physics of Biology Conference, Campus Biotech, Geneva (November 2016)

Invited talks at International Conferences (continued)

- **AShear thickening and dense suspensions** Invited speaker, Rheology of dense particulate suspensions, Washington (June 2016)
- **A Theory of Shear Thickening** Invited speaker, Dutch Soft Matter Meeting, Amsterdam (May 2016)
- **Marginal stability in packings of particles** Invited speaker, SIAM international conference (April 2016)
- **Shear Thickening** Invited speaker, Workshop Flow and Processing of Highly Filled Materials, ESPCI Paris (January 2016)
- **Theory of granular flow** Invited speaker, Santiago, Chile (November 2015)
- **Yielding transition** Invited speaker, Fluctuation-driven phenomena in non-equilibrium, Warwick (September 2015)
- **Plastic flow near jamming** Invited speaker, Japanese Society of Physics, Tokyo (March 2015)
- **Elementary excitations in disordered solids** Invited speaker, Workshop on Glassy Physics, Tokyo (March 2015)
- **Elementary excitations in disordered solids** Invited speaker, Unifying Concepts in Glassy Physics, Aspen, Colorado (February 2015)
- **Stability and Flow near Jamming** Invited speaker, Mini Stat. Mech. meeting, Berkeley (January 2015)
- **Marginal stability in glasses** Invited speaker, Non-Equilibrium conference, KITP, Santa-Barbara (October 2014)
- **Yielding transition in amorphous materials** Invited speaker at the ACS meeting on colloidal science, Upenn (June 2014)
- **On a mechanism for Shear-Thickening** Invited speaker at the German Physical Society, Dresden, Germany (April 2014)
- **Effect of elasticity on Fragility in supercooled liquids** Invited speaker at the Symposium on Fragility, JNCASR Bangalore, India (January 2014)
- **Fragility in supercooled liquids** Invited speaker at WittenFest, Chicago, (November 2013)
- **Marginal stability in glasses** Invited speaker at the Transport in Interacting Disordered Systems Conference, Barcelona, (September 2013)
- **Flow near Jamming** Invited speaker at the Soft Condensed Matter Physics Gordon Research Conference, Colby College, (August 2013)
- **Fragility and elasticity in supercooled liquids** Invited speaker at the 7th International Discussion Meeting on Relaxations in Complex Systems, Barcelona, July 21-26 (July 2013)
- **Rheology of dense flows** Invited speaker at the CECAM workshop on supercooled liquids and amorphous solids, ETH, Switzerland (June 2013)
- **Jamming: elasticity and flow** Invited speaker at the GDR MePhy, ESPCI, June 21 (June 2013)
- **Plastic flow** Invited speaker at the 7th MIT Conference on Computational Fluid and Solid Mechanics, June 12-14 (June 2013)
- **A Review of Jamming** Invited speaker at the APS March meeting, Baltimore (March 2013)
- **Avalanches in Packings** Invited speaker at the ACS meeting, Philadelphia (August 2012)
- **Marginal stability in granular media** Invited speaker at FACM Meeting, NJIT (May 2012)

Invited talks at International Conferences (continued)

- **Geometrical analysis of suspension flows near jamming** Invited speaker at the APS March meeting, Boston (February 2012)
- **Elasticity and dynamics in molecular liquids** Invited speaker at the conference "Emerging Concepts in Glass Physics", KITP (June 2010)
- **Boson peak, microscopic structure, and length scales in amorphous solids** Invited Speaker at the 6th International Discussion Meeting on Relaxations in Complex Systems, Rome (August 2009)
- **Locomotion in C.Elegans** Invited Speaker at the workshop "Neural circuit and behavior in C.elegans", Janelia Farm (March 2009)
- **Geometric interpretation of pre-vitrification in hard sphere glasses** Invited speaker at the APS March meeting, Pittsburg (March 2009)
- **Force propagation, transport, and length scales in amorphous solids** Invited speaker at the workshop on Topology, Structure and Dynamics in Non-Crystalline Solids, Paris (September 2009)
- **Soft motions of amorphous solids** Invited speaker at the Lorentz Center meeting on Dynamical heterogeneities in glasses, colloids and granular media, Leiden (August 2008)
- **Soft modes and dynamics in granular and colloidal flows** Invited Speaker at the Gordon Research Conference on Granular and Granular-Fluid Flow, Maine (June 2008)
- **Soft modes and dynamics in jammed packings and colloidal liquids** Invited Speaker at the DeGennes days, Paris (May 2008)
- **Soft Modes, Rigidity and Relaxation in Amorphous Solids** Invited Speaker at the XXXVIII Winter Meeting in Statistical Physics, Mexico (January 2008)
- **Soft Modes, Rigidity and Relaxation in Amorphous Solids** Invited Speaker at the Mini Stat Mech Meeting, Berkeley (January 2008)
- **Microstructure of Financial Markets** Invited Speaker at the Workshop on Dynamics and Complexity in People and Societies, Northwestern University (October 2007)
- **Jamming of soft particles** Invited Speaker at the New England Complex Fluid Meeting (2007)
- **Boson Peak in Weakly-Connected Amorphous Solids** Invited Speaker at the APS March meeting, Los Angeles (2005)

Seminars and Summer Schools

- More than thirty seminars or colloquia given in the last five years. Invited speakers to Summer Schools:
- **Statistical physics and machine learning back together** Invited speaker, Cargese, (August 2018)
- **Summer School on Physics and Mechanics of Soft Complex Materials** Invited speaker, Cargese, (August 2017)
- **Flowing Soft Matter: Bridging the Gap between Statistical Physics and Fluid Mechanics** International Centre for Mechanical Sciences in Udine (June 2014)
- **Spin Glass and Beyond: An old tool for new problems** Cargese, Corsica, France (August 2014)

Professional Service

- **Organizer** Conferences: Workshop on Theoretical Advances in Deep Learning, Istanbul, July (2019). "Active Jammed Systems", New York University, May (2012).

- **Organizer** Seminar series: "Seminar on Complex systems", a seminar on statistical physics and biophysics, Lausanne (2015-present). "Applied Mathematics Seminars", A weekly seminar on soft matter and applied mathematics, broadly interpreted. Harvard (2006-2007).

- **Referee for approximately 15 papers per year in Physics and Biophysics:** Science, PNAS, Physical Review Letters, Physical Review E, Europhysics Letters, Europhysics Journals, Plos Computational Biology, Frontier Neuroscience

- **Referee for Grant agencies:** NSF Division of Materials, NSF Chemistry, Petroleum Research Fund, ANR

- **Referee for Books:** Cambridge University Press

Funding

- **Simons Collaboration on Cracking the Glass problem**. Simons Foundation. PI's: S. Nagel, L. Berthier, G. Biroli, P. Charbonneau, E. Corwin, S. Franz, J. Kurchan, A. Liu, L. Manning, G. Parisi, D. Reichmann, M. Wyart, F. Zamponi (2015-2023)

- **How granular materials yield and flow?** Swiss National Foundation **200021** PI: Matthieu Wyart (2016-2020).

- **Simons Investigator**. These funds are not attached to a specific project (2015-2020). Funding was stopped due to my move to EPFL.

- **Random organization of disordered solids.** IRG1, MRSEC, PI's: Matthieu Wyart, Jasna Brujic, Aleksandar Donev, Magued Iskander, Stefano Sacanna, Mike Shelley, David Pine, Paul Chaikin (2014-2020). Funding was stopped due to my move to EPFL.

- **How do granular materials yield?** NYU Poly Seed Fund Grant **M8769**, PI's: Matthieu Wyart, Mark Iskander (2013-2014)

- **Connecting Glassy Dynamics to Micro-Scale Elasticity.** NSF CBET, **1236378**, PI: Matthieu Wyart. Co-PI: David Pine. (2012-2015)

- **Connecting the Rheology of Granular Materials and Suspensions to the Rewiring of their Packing.** Seed Grant, NYU MRSEC, PI: Matthieu Wyart, (2012-2014)

- **Theoretical Study of the Rheology and Characteristic Length Scales of Granular Flows and Suspensions Based on an Analogy with the Plasticity of Glasses.** Petroleum Research Fund **5**2031-DNI9 PI: Matthieu Wyart (2011-2013)

- **Soft Modes and Critical Properties of Shear Flows Near the Jamming Threshold.** NSF DMR, **105387**, PI: Matthieu Wyart, (2011-2014)

- **Sloan Fellowship** PI: Matthieu Wyart. These funds are not attached to a specific project. (2011-2013)

Teaching

- **Statistical Mechanics III: Complex systems** Master level, (2016-present)

- **Statistical Mechanics II: Phase transitions** Bachelor, (2015-present)

- **Physics I** Undergraduate, Fall 2014

Teaching (continued)

- **Physics III** Undergraduate, Fall 2014
- **Phase transition and critical phenomena** Graduate, Spring 2012, Spring 2013, Spring 2014
- **The physics of sound and music** Undergraduate, Fall 2011, Fall 2012
- **Introduction to solid state physics** Graduate, Fall 2010

Committees

- **Committee for the Institute of Advance Studies EPFL-University of Geneva** (2018-2019)
- **Teaching Committee, Physics Institute, EPFL** (2018-present)
- **Faculty Search Committee, Physics Institute, EPFL** 2017, 2019
- **Committee on Honors and Nominations** 2013
- **Graduate Admissions Committee** 2011, 2012
- **Faculty Search Committee, Center for Soft matter Research, Physics Department** 2010, 2011, 2012, 2013
