

FRANÇOIS GUILLARD

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Born in Poitiers (France)
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Education

	<i>Education</i>
2018	Lecturer Sydney Centre in Geomechanics and Mining Materials, School of Civil Engineering, the University of Sydney (Australia).
2014-2017	Post-doctoral researcher Supervisors: I. EINAV, L. SHEN. Particles and Grains Laboratory, the University of Sydney (Australia).
2015-2017	Licensed X-ray radiation user for research Local Radiation Safety Coordinator School of Civil Engineering, the University of Sydney, New South Wales.
2010-2013	PhD Degree (obtained 2013-12-11 <i>with first class honours</i>) <i>Drag and lift forces in granular media.</i> Supervisors: O. POULIQUEN, Y. FORTERRE. IUSTI laboratory, Aix-Marseille University (France).
2010	Master's Degree (obtained <i>cum laude</i>) <i>Fundamental Physics – Physics of out-of-equilibrium phenomena</i> École Normale Supérieure of Lyon (France).
2008	Bachelor's degree (obtained <i>cum laude</i>) <i>Science of Matter – Physics</i> École Normale Supérieure of Lyon (France)
2007-2010	Student at the École Normale Supérieure of Lyon (France) Physics Department.
2005-2007	Preparatory school for entrance examinations to the French Grandes Écoles. Lycée Louis-le-Grand, Paris (France)
2005	High School Diploma in Science (obtained <i>magna cum laude</i>) Lycée Victor Hugo, Poitiers (France)

Additional Research Experience

	<i>Additional Research Experience</i>
2009/05 – 2009/07	<i>Control parameters in recorder playing</i> Supervisor: B. FABRE. Research team: Instrument-Making, Acoustics, Musics. Jean Le Rond d'Alembert Institute, Paris 6 University (France).
2008/06 – 2008/07	<i>Pattern formation in flows of colloidal suspension</i> Supervisor: S. MANNEVILLE Physics laboratory of the École Normale Supérieure of Lyon (France).

Kinematic model of transient shape-induced anisotropy in dense granular flow

NADLER B., GUILLARD F., EINAV I. *Physical Review Letters*, **120** 198003, 2018.

Energy dissipation from two-glass-bead chains under impact

JIANG S., SHEN L., GUILLARD F., EINAV I. *International Journal of Impact Engineering*, **114C** 160–168, 2018.

Evidence that strain-rate softening is not necessary for material instability patterns

VALDÈS J. R., GUILLARD F., EINAV I. *Physical Review Letters*, **119** 118004, 2017.

Dynamic X-ray radiography reveals particle size and shape orientation fields during granular flow

GUILLARD F., MARKS B., EINAV I. *Scientific Reports*, **7** 8155, 2017.

Scaling laws for segregation forces in dense sheared granular flows

GUILLARD F., FORTERRE Y., POULIQUEN O. *Journal of Fluid Mechanics*, **807** R1, 2016.

Transition failure stress in a chain of brittle elastic beads under impact

LIU D., SHEN L., GUILLARD F., EINAV I. *Int. Journal of Impact Engineering*, **93** 222, 2016.

Dynamic patterns of compaction in brittle porous media

GUILLARD F., GOLSHAN P., SHEN L., VALDÈS J., EINAV I. *Nature Physics*, **11** 835, 2015.

Origin of a depth-independent drag force induced by stirring in granular media.

GUILLARD F., FORTERRE Y., POULIQUEN O. *Physical Review E*. **91** 022201, 2015.

Lift forces in granular media.

GUILLARD F., FORTERRE Y., POULIQUEN O. *Physics of Fluids*, **26** 043301, 2014.

Depth-independent drag force induced by stirring in granular media.

GUILLARD F., FORTERRE Y., POULIQUEN O. *Physical Review Letters*, **110** 138303, 2013

Selected Conference Proceedings

Compaction dynamics of crunchy granular material

F. GUILLARD, P. GOLSHAN, L. SHEN, J. R. VALDÈS, I. EINAV *EPJ Web of Conferences*, 2017.

Velocity Measurement of Granular Flows Using Dynamic X-ray Radiography

F. GUILLARD, B. MARKS, I. EINAV *International Conference on Bulk Materials Storage, Handling and Transportation*, 2016.

Dynamique de compaction d'un milieu granulaire fragile

GUILLARD F., GOLSHAN P., SHEN L., VALDÈS J., EINAV I. *22^e Congrès Français de Mécanique*, 2015.

Force de ségrégation sur une particule dans les écoulement granulaire cisailé

GUILLARD F., FORTERRE Y., POULIQUEN O. *22^e Congrès Français de Mécanique*, 2015.

Drag and lift forces in granular media.

GUILLARD F., FORTERRE Y., POULIQUEN O. *European Planetary Science Congress*, 2013.

Traînée et portance dans un milieu granulaire

GUILLARD F., FORTERRE Y., POULIQUEN O. *21^e Congrès Français de Mécanique*, 2013.

Forces subies par un objet en mouvement dans un milieu granulaire

GUILLARD F., FORTERRE Y., POULIQUEN O. *13^e journées de la Matière Condensée*, 2012.

The behaviour of free-flowing granular intrudersE. WYBURN, F. GUILLARD, B. MARKS AND I. EINAV *EPJ Web of Conferences*, 2017.**Experimental study of shear rate dependence in perpetually sheared granular matter**S. LIU, F. GUILLARD, B. MARKS, P. ROGNON AND I. EINAV *EPJ Web of Conferences*, 2017.**Energy dissipation mechanism in single glass bead under impact**S. JIANG, L. SHEN, I. EINAV, AND F. GUILLARD *International Conference on Geomechanics, Geo-energy and Geo-resources*, 2016.**High speed X-ray imaging of particulate flows**B. MARKS, F. GUILLARD, I. EINAV *International Conference on Bulk Materials Storage, Handling and Transportation*, 2016.**Particle Shape Effects on Flowability of Powder Mixtures**E. WYBURN, B. MARKS, F. GUILLARD, P. ROGNON, I. EINAV *International Conference on Bulk Materials Storage, Handling and Transportation*, 2016.**Numerical Investigation on the Failure Behavior of Brittle Granular Chain under Impact**D. LIU, L. SHEN, I. EINAV, F. GUILLARD *Applied Mechanics & Materials*, 2016.**Structuring music in recorder playing: a hydrodynamical analysis of blowing control parameters.**B. FABRE, F. GUILLARD, M. SOLOMON, F. BLANC AND V. SIDORENKOV *Proceedings of 20th International Symposium on Music Acoustics*, 2010.

Conference presentations

Conference presentations

- European Geoscience Union general assembly (Austria), 2018/04
- Statistical Mechanics of Soft Matter, Sydney (Australia), 2017/11
- Invited speaker at Theory of Porous Media: Experiments and Simulations, Brisbane (Australia) 2017/09
- Powders & Grains, Montpellier (France), 2017/07
- Invited speaker at Advancing Experimental Geomechanics workshop (Australia) 2016/11
- International Conference on Bulk Materials Storage, Handling and Transportation (Australia) 2016/07
- Invited speaker at International Symposium on Plasticity, Hawaii (United States), 2016/01
- Invited speaker at Soft and Granular Matter in Ambient and Extreme Conditions, Chángshā (China) 2015/09
- 22nd French Mechanics Congress, Lyon (France) 2015/08
- Computational Fracture Conference, Paris (France), 2014/06
- Invited talk San Diego State University (United States), 2014/10
- European Planetary Science Congress, London (United Kingdom) 2013/09
- 21st French Mechanics Congress, Bordeaux (France) 2013/08
- IMA Conference on Dense Granular Flows, Cambridge (United Kingdom) 2013/07
- Annual Meeting of APS Division of Fluid Dynamics, San Diego CA (United States) 2012/11

Teaching

Teaching

- Geotechnical Engineering (partially) [20h, 2 years]
Bachelor's degree – School of Civil Engineering, The University of Sydney (Australia)
- Programming with LabView [2h course]
PhD degree – School of Civil Engineering, The University of Sydney (Australia)
- C language (computing science) [Tutorials, 72h in 3 years]
Bachelor's degree – École Polytechnique Universitaire of Marseille (France)
- Probabilities and Statistics [Tutorials, 20h in 1 year]
Bachelor's degree – École Polytechnique Universitaire of Marseille (France)

Students supervision

Students supervision

Name	Level	Years	Duration	Subject
S. Liu	PhD student	2015-2018	3 years	Granular rheology in 3-dimensional stadium shear device
S. Jiang	PhD student	2016-2019	3 years	Energy dissipation and surface creation under high speed impacts
S. Méjean	PhD student	2015-2018	3 years	Granular jumps
E. Wyburn	PhD student	2015-2018	3 years	Flowability improvement using particle shape modification
B. Leighton	Undergraduate	2017	1 year	From art to granular science
R. He	Undergraduate	2017	1 year	Compaction of brittle porous rocks
C. Vigouroux	Honour student	2017	5 months	Fracture opening in complex fluid
M. Cousin	Honour student	2016	2 months	Size segregation of bubbles
I. Tasnim Hossain	Master thesis	2015-2016	1 years	Multicomponent tensile buckling
M. El Samad	Master thesis	2015-2016	1 years	Shear rate softening of granular materials during stick-slip experiment
D. Liu	Master thesis	2015-2016	1 year	High-speed impact on brittle material
A. Luu	Summer scholar	2015-2016	12 weeks	From a bowl of cereal to collapsing dam
C. Rulquin	Undergraduate	2012	1 month	Drag reduction when digging in granular media
	Master	2012	1 week	Lift in yield stress fluid: can one fly in yogurt?

Multiple participation to progress review panels for PhD students.

Popularization actions

Popularization actions

- Discussion after the projection of scientific and artistic movies. Participation to the RISC festival (International meeting Science and Cinema).
Association: *Polymagoo*.
- Presentations of experiments on granular media to students from 6 to 17 years old.
Associations: *Polymagoo* (Marseille), *Les Ateliers de Curiosité* (Aix-en-Provence).
- Animations about granular materials to general public
Palais Longchamp (Marseille) – Association: *Les Petits Débrouillards*

Computing skills

Computing skills

- Knowledge of Liggghts, a software dedicated to Molecular Dynamic Simulations for Granular Materials.
- Programming in various languages (C++, Matlab, Python, LabView, L^AT_EX, Bash, HTML, Javascript ...)
- Knowledge of main softwares in Linux, Macintosh, Windows.

Foreign Languages

Foreign Languages

French: mother tongue.

English: good level. Level assessed in 2013 by an IELTS test score of 8.

(Listening: 8.5/9, Reading: 9/9, Writing: 6.5/9, Speaking: 7/9)

Italian: moderate.

Basic notions in **Latin** and **Ancient greek**.

Other interests

Other interests

- Hiking
- Classical guitar player
- Amateur astronomer
- Analog photography
- Software development