



## Cyril Gadal, PhD

### Scientific interests

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 Scholar: Cyril Gadal

 [github.com/Cgadal](https://github.com/Cgadal)

 <https://cgadal.github.io/>

**Institut de Mécanique des Fluides de Toulouse**  
2 Allée du Professeur Camille Soula  
31400 Toulouse  
France

FLUID AND GRANULAR PHYSICS  
Sediment transport and bedforms  
Suspensions, particle-driven gravity currents  
Instabilities, patterns

QUANTITATIVE GEOMORPHOLOGY  
Coupling fundamental physics and geophysical data

MODELLING & THEORY  
Bedform instabilities  
Gravity/Turbidity currents

OPEN SCIENCE

2021 - 2022 **Postdoctoral researcher at the Institut de Mécanique des Fluides de Toulouse** Toulouse, France  
*Experimental study of turbidity currents*  
in collaboration with Dr. L. Lacaze and Dr. M. Mercier.

2019 (3 mths) **Visiting student at the DAMTP, University of Cambridge** Cambridge, UK  
*Experimental study of impact craters using yield-stress fluids*  
by supervised by Prof. J.A. Neufeld, Dr. M. Landeau and Prof. S.B. Dalziel.

## EDUCATION

2017 - 2020 **Ph.D. in Geophysics**, supervised by Prof. C. Narteau and Prof. P. Claudin

*DUNE EMERGENCE IN MULTIDIRECTIONAL WIND REGIMES.*

Defended on 2020, October 15<sup>th</sup>

Institut de physique du globe de Paris (IPGP) & PMMH - ESPCI. *Very Honorable, with Committee Praise.*

2016 - 2017 **Master of Science**, major in fundamental fluid dynamics.

École Normale Supérieure & Université Paris Cité, *magna cum laude honors.*

**Master thesis:** *Dune instability in bidirectional wind regimes.*

supervision: Prof. C. Narteau & Prof. P. Claudin [6 months], Institut de physique du globe de Paris (IPGP).

2014 - 2017 **Master of Science**, major in *Earth Sciences*.

École Normale Supérieure, *magna cum laude honors.*

**Research internship:** *Numerical study of Nebkha dunes.*

Supervision: Dr. J.M. Nield [6 months], University of Southampton (Southampton, UK).

**Research internship:** *Including non-linearities in the theory of mountain lee waves.*

Supervision: Dr. F. Lott [2 months], Laboratoire de Météorologie Dynamique (Paris, France).

2012 - 2014 Preparatory classes for Grandes Écoles, *Physics-Chemistry*. Lycée Plerre de Fermat, Toulouse, France

2011 - 2012 Scientific baccalaureate certificate, *Physics-Chemistry-English major, summa cum laude honors*

## 1- PUBLICATIONS & COMMUNICATIONS

### ⊙ 10 Referee articles

*The list of publications is presented on page 3*

### ⊙ 11 Oral communications, among which:

1 invited talks, 5 contributed talks, 2 invited seminars, 3 posters

*The list of oral communications is presented on page 4*

2- FUNDINGS	<ul style="list-style-type: none"> <li>▣ <b>Grant for international mobility</b>, 2750 € from Institut de Physique du Globe de Paris (2019)</li> <li>▣ <b>Grant for international mobility</b>, 2750 € from Université Paris Cité (2019)</li> <li>▣ <b>Scholarship for PhD</b>, 3 yrs funding from Université Paris Cité (2017)</li> </ul>
3- STUDENT SUPERVISION	<ul style="list-style-type: none"> <li>◇ Jean Schneider, <b>Visiting PhD Student</b>, co-supervision with Dr. M. Mercier &amp; Dr. L. Lacaze 2022. <ul style="list-style-type: none"> <li>• Particle distribution in constant inflow three-phase turbidity current.</li> </ul> </li> <li>◇ Aurélien Schaff, <b>Master thesis</b>, co-supervision with Dr. M. Mercier &amp; Dr. L. Lacaze 2022. <ul style="list-style-type: none"> <li>• Trapping suspended particles using bottom roughness in a channel flow.</li> </ul> </li> <li>◇ Colin Chanteloube, <b>Master thesis</b>, co-supervision with Prof. C. Narteau &amp; Dr. L. Barrier, 2020. <ul style="list-style-type: none"> <li>• Source-To-Sink Aeolian Fluxes From Arid Landscape Dynamics in the Lut Desert. <i>Colin is now a PhD student at the IPGP, France</i></li> </ul> </li> <li>◇ Jeanne Alkalla, <b>2-month undergraduate internship</b>, co-supervision with Prof. C. Narteau, 2020. <ul style="list-style-type: none"> <li>— Linking defect density in dune patterns to the wind regime.</li> </ul> </li> </ul>
5- TEACHING	<ul style="list-style-type: none"> <li>△ Mathematics Hands-on classes, Freshman and Sophomore years, Paris Sud University, 2017-2020</li> <li>△ Physics Hands-on classes, Freshman and Sophomore years, Paris Sud University, 2017-2020</li> <li>△ "Dealing with scientific articles" classes, Freshman and Sophomore years, Paris Sud University, 2017-2020</li> <li>△ Private lessons <i>Mathematics, Physics, Chemistry, Biology &amp; Earth sciences</i>, Highschool, weekly, 5 students from 2014 to 2019</li> </ul>
7- PEER REVIEWING	<ul style="list-style-type: none"> <li>◇ Referee for <i>Journal of Fluid Dynamics</i>, 2022</li> <li>◇ Referee for <i>Water Resources Research</i>, 2022</li> <li>◇ Referee for <i>Earth Surface Dynamics</i>, 2021</li> </ul>
9- LANGUAGE PROFICIENCY	<p>French: Native English: Fluent Spanish: Educational level (A2)</p>

## List of publications

Dr. Cyril Gadal

Top 5 publications are indicated by the ★ symbol

### 10 Referee articles

111 citations (H-index=6)

### FIRST AUTHOR ARTICLES

10. ★ Local wind regime induced by giant linear dunes: comparison of ERA5-Land reanalysis with surface measurements.  
**Gadal, C.**, Delorme, P., Narteau, C., Wiggs, F.S.W., Baddock, M., Nield, J.M. & Claudin, P., (2022)  
*Boundary Layer Meteorology*, 185, pages 309–332, doi:10.1007/s10546-022-00733-6
9. Coexistence of Two Dune Growth Mechanisms in a Landscape-Scale Experiment.  
Lü, P., Narteau, C., Dong, Z., Claudin, P., Rodriguez, S., An, Z., **Gadal, C** & Courrech du Pont, S. (2022).  
*Geophysical Research Letter*, 49(11), e2021GL097636, doi:10.1029/2021GL097636
8. Source-To-Sink Aeolian Fluxes From Arid Landscape Dynamics in the Lut Desert.  
Chanteloube, C., Barrier, L., Derakhshani, D., **Gadal, C.** Braucher, R., Payet, V., Léanni, L. & Narteau, C. (2022)  
*Geophysical Research Letters*, 49, e2021GL097342, doi:10.1029/2021GL097342
7. Migration of Reversing Dunes Against the Sand Flow Path as a Singular Expression of the Speed-Up Effect.  
Gao, X., Narteau, C., & **Gadal, C.** (2021)  
*Journal of Geophysical Research: Earth Surface*, 126, e2020JF005913, doi:10.1029/2020JF005913
6. ★ Direct validation of dune instability theory.  
Lü, P., Narteau, C., Dong, Z., Claudin, P., Rodriguez, S., An, Z., Fernandez-Cascales, L., **Gadal, C** & Courrech du Pont, C. (2021)  
*PNAS*, 118, e2024105118, doi:10.1073/pnas.2024105118
5. ★ Spatial and Temporal Development of Incipient Dunes.  
**Gadal, C.**, Narteau, C., Ewing, R. C., Gunn, A., Jerolmack, D., Andreotti, B., & Claudin, P. (2020)  
*Geophysical Research Letters* 47, e2020GL088919, doi:10.1029/2020GL088919
4. ★ Periodicity in fields of elongating dunes.  
**Gadal, C.**, Narteau, C., Courrech du Pont, S., Rozier, O. & Claudin, P. (2020)  
*Geology* 48, 343-347, doi:10.1130/G46987.1
3. Elongation and stability of a linear dune.  
Rozier, O., Narteau, C., **Gadal, C.**, Claudin, P. & Courrech du Pont, S. (2019)  
*Geophysical Research Letters* 46, 14521-14530, doi:10.1029/2019GL085147
2. ★ Incipient bedforms in a bidirectional wind regime.  
**Gadal, C.**, Narteau, C., Courrech du Pont, S., Rozier, O. & Claudin, P. (2019)  
*Journal of Fluid Mechanics* 862, 490-516, doi:10.1017/jfm.2018.978
1. Morphodynamics of barchan and dome dunes under variable wind regimes.  
Gao, X., **Gadal, C.**, Rozier, O. & Narteau, C. (2018)  
*Geology* 46, 743-746, doi:10.1130/G45101.1

## List of oral communications

Dr. Cyril Gadat

**11 Oral communications**, among which:

**1 invited talks**

**5 contributed talks**

**2 invited seminars**

**3 posters**

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### INVITED TALKS

1. Dune emergence: multidirectional wind regimes and boundary conditions.  
2020, American Geophysical Union, Fall Meeting 2020

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### CONTRIBUTED TALKS

5. Experimental lock-release turbidity currents: slope, volume fraction and settling velocity.  
2022, IUTAM Symposium: From Stokesian suspension dynamics to particulate flows in turbulence
4. Experimental lock-release turbidity currents: slope, volume fraction and settling velocity.  
2022, THESIS-2022 Two-pHase modELing for Sediment dynamIcS
3. Periodicity in fields of elongating dunes.  
2019, WindyDay 2019
2. Dune growth under multidirectional wind regimes.  
2018, ICAR X
1. Dune growth under multidirectional wind regimes.  
2017, Euromech 588: Coupling Mechanisms and Multi-Scaling in Granular-Fluid Flows.

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### INVITED SEMINARS

2. Dune emergence in multidirectional wind regimes.  
2020, Insitut de Mécanique des Fluides de Toulouse, Toulouse, France
1. Dune emergence under bidirectional wind regimes.  
2019, Insitut de physique du globe de Paris, France

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### POSTERS

3. Periodicity in elongating dune fields controlled by boundary conditions.  
2019, EGU General Assembly 2019
2. Size control in fields of elongating dunes.  
2018, WindyDay 2018
1. Dune growth under multidirectional wind regimes.  
2017, American Geophysical Union, Fall Meeting 2017