







## Research Publications

- 1 C. Binetti, **A. Cannizzo**, G. Florio, N. M. Pugno, G. Puglisi, and S. Giordano, “Exploring the impact of thermal fluctuations on continuous models of adhesion,” *International Journal of Engineering Science*, vol. 208, p. 104 194, 2025, ISSN: 0020-7225.  DOI: <https://doi.org/10.1016/j.ijengsci.2024.104194>.
- 2 **A. Cannizzo**, M. Benedito, F. Manca, and S. Giordano, “Modeling mechanical micro-instabilities in biophysics and materials science,” in *Nanoscience & Nanotechnologies, Critical Problems, Science in Society, Historical Perspective*, R. Pisano, Ed., Springer Nature, Jul. 2025.
- 3 **A. Cannizzo** and S. Giordano, “Statistical mechanics approaches for studying temperature and rate effects in multistable systems,” *Symmetry*, vol. 16, no. 5, 2024, ISSN: 2073-8994.  DOI: [10.3390/sym16050632](https://doi.org/10.3390/sym16050632).
- 4 **A. Cannizzo**, “Statistical mechanics and thermodynamics of adhesion, phase transformations, and fracture in micro- and nano-systems,” Theses, Centrale Lille Institut ; Politecnico di Bari, Dec. 2023.  URL: <https://theses.hal.science/tel-04508901>.
- 5 **A. Cannizzo** and S. Giordano, “Thermal effects on fracture and the brittle-to-ductile transition,” *Physical Review E*, vol. 107, p. 035 001, 3 Mar. 2023.  DOI: [10.1103/PhysRevE.107.035001](https://doi.org/10.1103/PhysRevE.107.035001).
- 6 **A. Cannizzo**, L. Bellino, G. Florio, G. Puglisi, and S. Giordano, “Thermal control of nucleation and propagation transition stresses in discrete lattices with non-local interactions and non-convex energy,” *The European Physical Journal Plus*, vol. 137, no. 5, p. 569, May 2022, ISSN: 2190-5444.  DOI: [10.1140/epjp/s13360-022-02790-9](https://doi.org/10.1140/epjp/s13360-022-02790-9).
- 7 **A. Cannizzo**, G. Florio, G. Puglisi, and S. Giordano, “Temperature controlled decohesion regimes of an elastic chain adhering to a fixed substrate by softening and breakable bonds,” *Journal of Physics A: Mathematical and Theoretical*, vol. 54, no. 44, p. 445 001, Oct. 2021.  DOI: [10.1088/1751-8121/ac2a07](https://doi.org/10.1088/1751-8121/ac2a07).

# Doctoral Thesis

Ph.D. in Planetology, Gustave Eiffel University (Bouguenais, France) and Nantes University (Nantes, France), December 2023.

**Dissertation: Study of the cohesive properties of ice powders: applications to the surface of the icy moons of Jupiter and Saturn.**

## List of publications

### Book Chapters

A. Lagain, S. Bouley, D. Baratoux, C. Marmo, F. Costard, O. Delaa, A. Pio Rossi, M. Minin, G.K. Benedix, M. Ciocco, B. Bedos, A. Guimpier, E. Dehouck, D. Loizeau, A. Bouquety, J. Zhao, A. Vialatte, M. Cormau, E. Le Conte des Floris, F. Schmidt, P. Thollot, J. Champion, M. Martinot, J. Gargani, P. Beck, J. Boisson, N. Paulien, A. Séjourné, K. Pasquon, N. Christoff, I. Belgacem, F. Landais, B. Rousseau, L. Dupeyrat, M. Franco, F. Andrieu, B. Cecconi, S. Erard, **B. Jabaud**, V. Malarewicz, G. Beggiato, G. Janez, L. Elbaz, C. Ourliac, M. Catheline, M. Fries, A. Karamoko, J. Rodier, R. Sarian, A. Gillet, S. Girard, M. Pottier, S. Strauss, C. Chanon, P. Lavaud, A. Boutaric, M. Savourat, E. Garret, E. Leroy, M.-C. Geffray, L. Parquet, M.-A. Delagoutte, O. Gamblin (2021). "Mars Crater Database: A participative project for the classification of the morphological characteristics of large Martian craters", *Large Meteorite Impacts and Planetary Evolution VI*.

### Journal Articles

**B. Jabaud**, R. Artoni, G. Tobie, E. Le Menn, P. Richard. "Cohesive properties of ice powders analogous to fresh plume deposits on Enceladus and Europa", *Icarus*, 2024.

N. Le Becq, S. Conway, **B. Jabaud**, G. Tobie, R. Artoni. "A new model of crater degradation on Ceres involving ice sublimation and talus formation", *Icarus*, 2024.

**B. Jabaud**, R. Artoni, E. Le Menn, V. Munoz Iglesias, G. Tobie, S. Conway. “Mechanical properties of salty ice powders as better analogues of Europa’s regolith”, *in prep.*

R. Artoni, P. Richard, E. Le Menn, G. Tobie, **B. Jabaud**, A. Pol. “Discrete numerical analysis of cohesive granular flow in a thin rotating drum: flow regimes and cohesion estimation”, *in prep.*

## International Conferences with Extended Abstracts

**B. Jabaud**, N. Le Becq, R. Artoni, G. Tobie, E. Le Menn, S. Conway, P. Richard (2023). “Cohesive properties of ice powders and mixtures as analogues of regoliths of icy worlds”, *DPS-EPSC 2023 Joint Meeting*.




**B. Jabaud**, R. Artoni, G. Tobie, E. Le Menn, P. Richard (2023). “Dynamical Characterization of the cohesion of ice powders at very low temperatures”, *International Congress on Particle Technology PARTEC*.

**B. Jabaud**, R. Artoni, G. Tobie, E. Le Menn, P. Richard (2023). “Cohesive properties of fresh deposits analogues on Enceladus and Europa”, *LPI Contribution – 54<sup>th</sup> LPSC*, No. 2806.

**B. Jabaud**, R. Artoni, G. Tobie, E. Le Menn, P. Richard (2022). “The icy regoliths of Enceladus and Europa: experimental and numerical study”, *Copernicus – EPSC 2022*. doi: 10.5194/epsc2022-466.

**B. Jabaud**, R. Artoni, G. Tobie, E. Le Menn, P. Richard (2022). “The icy regoliths of the Solar System: experimental and numerical study”, *World Congress on Particle Technology WCPT22*.



## Esperienza Lavorativa






- 2024 – 2025  **Analista Quantitativo.**  
**Iason Consulting Ltd, Milano (Italia).**  
Implementazione di tecniche avanzate matematiche e statistiche di risk management per portafogli finanziari, in conformità ai quadri normativi vigenti (FRTB e Basilea II). Automattizzazione di processi di reportistica e previsione di potenziali criticità nei Profit and Loss Attribution Test (PLAT). Sviluppo e implementazione di strategie di ottimizzazione del profitto per Liquidity Providers in ambienti di finanza decentralizzata (DeFi), in particolare all'interno del framework degli Automated Market Maker.
- 2020 – 2023  **Doppio dottorato in co-tutela in *Micro et nano technologies, acoustique et télécommunications* presso l'École Centrale de Lille (Francia) e in *Ingegneria Meccanica e Gestionale* presso il Politecnico di Bari (Italia).**  
Titolo tesi: *Modeling micro-instabilities in biophysics and materials science*. Analisi di meccanica statistica dei processi di coesione e decoesione, delle trasformazioni di fase in biofisica, in micro- e nano-sistemi e dei fenomeni di frattura in sistemi complessi, con particolare attenzione agli effetti termodinamici. Creazione di codici MatLab per l'individuazione di strategie efficaci nella risoluzione analitica degli osservabili fisici.
- 2018 – 2019  **Associate Consultant. Novaeka, Padova (Italia).**  
Creazione di modelli di simulazione dinamica nel settore aerospaziale (Matlab), collaborato con medici per la prototipazione di un nuovo tipo di dispositivo medico per la micro-somministrazione automatizzata di farmaci (progettazione CAD e consulenza brevetti). Coordinamento internazionale per la progettazione di un prodotto commerciale nell'aftermarket della cybersicurezza automobilistica.

## Educazione

- 2020 – 2023  **Doppio dottorato in co-tutela in *Micro et nano technologies, acoustique et télécommunications* presso l'École Centrale de Lille (Francia) e in *Ingegneria Meccanica e Gestionale* presso il Politecnico di Bari (Italia).**  
Titolo tesi: *Modeling micro-instabilities in biophysics and materials science* [\[link\]](#). Design teorico, modellizzazione e simulazioni numeriche (Matlab).
- 2015 – 2018  **Laurea Magistrale in Fisica Teorica e Modellistica.**  
**Università degli Studi di Padova e Alma Mater Studiorum Università di Bologna.**  
Titolo tesi: *Optimization of vehicle flows on an urban road network through traffic lights and velocity self-control*. Teoria, design modello e simulazioni numeriche (C++).
- 2011 – 2014  **Laurea Triennale in Fisica, Università degli Studi di Padova.**  
Titolo tesi: *In silico study of mechanisms of autocatalytic reactions in micro-geometries*. Teoria, design modello e simulazioni numeriche (C++, libreria OpenFOAM).



## Pubblicazioni

-  C. Binetti, A. Cannizzo, G. Florio, N. M. Pugno, G. Puglisi, and S. Giordano, "Exploring the impact of thermal fluctuations on continuous models of adhesion," *International Journal of Engineering Science*, vol. 208, p. 104194, 2025, ISSN: 0020-7225.  DOI: <https://doi.org/10.1016/j.ijengsci.2024.104194>.

- 2 **A. Cannizzo**, M. Benedito, F. Manca, and S. Giordano, "Modeling mechanical micro-instabilities in biophysics and materials science," in *Nanoscience & Nanotechnologies, Critical Problems, Science in Society, Historical Perspective*, R. Pisano, Ed., Springer Nature, Jul. 2025.
- 3 **A. Cannizzo** and S. Giordano, "Statistical mechanics approaches for studying temperature and rate effects in multistable systems," *Symmetry*, vol. 16, no. 5, 2024, ISSN: 2073-8994.  DOI: [10.3390/sym16050632](https://doi.org/10.3390/sym16050632).
- 4 **A. Cannizzo**, "Statistical mechanics and thermodynamics of adhesion, phase transformations, and fracture in micro- and nano-systems," Theses, Centrale Lille Institut ; Politecnico di Bari, Dec. 2023.  URL: <https://theses.hal.science/tel-04508901>.
- 5 **A. Cannizzo** and S. Giordano, "Thermal effects on fracture and the brittle-to-ductile transition," *Physical Review E*, vol. 107, p. 035 001, 3 Mar. 2023.  DOI: [10.1103/PhysRevE.107.035001](https://doi.org/10.1103/PhysRevE.107.035001).
- 6 **A. Cannizzo**, L. Bellino, G. Florio, G. Puglisi, and S. Giordano, "Thermal control of nucleation and propagation transition stresses in discrete lattices with non-local interactions and non-convex energy," *The European Physical Journal Plus*, vol. 137, no. 5, p. 569, May 2022, ISSN: 2190-5444.  DOI: [10.1140/epjp/s13360-022-02790-9](https://doi.org/10.1140/epjp/s13360-022-02790-9).
- 7 **A. Cannizzo**, G. Florio, G. Puglisi, and S. Giordano, "Temperature controlled decohesion regimes of an elastic chain adhering to a fixed substrate by softening and breakable bonds," *Journal of Physics A: Mathematical and Theoretical*, vol. 54, no. 44, p. 445 001, Oct. 2021.  DOI: [10.1088/1751-8121/ac2a07](https://doi.org/10.1088/1751-8121/ac2a07).

## Esperienza


### Conferenze

- 2023  **RNL 2023. Parigi, Francia.** Organizzato dall'associazione *Rencontre du Non-Linéaire - RNL (Meetings on Non-Linearity)* e l'Università di Parigi *Université Paris Cité*. Presentazione e titolo del poster accademico: *Statistical mechanics of fracture phenomena and brittle-to-ductile transitions*. <https://sfnpnet.fr/rencontre-du-non-lineaire-2023-rnl-2023>.
- 2021  **MePhy + Houches. Les Houches, Francia.** Organizzato dal gruppo *Mechanics and Physics of Complex Systems - GDR Mephy* e Scuola di Fisica di Les Houches. Titolo presentazione: *Modeling micro-instabilities in biophysics and materials science*. <https://mephsociety.wordpress.com/mephyhouches-23-26-aout-2021/>.

### Grants

- 2022  **I-SITE - International Research Mobility Grant. Lille, Francia.** Borsa di mobilità per giovani ricercatori e dottorandi a supporto della collaborazione internazionale tra Centrale Lille (Francia) e il Politecnico di Bari (Italia).


### Brevetti

- 2019  **Provisional Patent Application**, Deposito di una domanda di brevetto provvisorio (PPA) presso l'Ufficio Brevetti e Marchi degli Stati Uniti (USPTO) per un design di prodotto per l'aftermarket degli Apple AirPods (prima generazione).

### Premi

- 2012  **i-father - Short Film Award. Rome, Italy.** Vincitore del concorso per cortometraggi *i-father - Short Film Award 2012* sponsorizzato dalla *Fondazione Ente dello Spettacolo di Roma*, Roma, Italia.

## Skills

- Analitiche  Solide capacità analitiche, modellizzazione di sistemi fisici e naturali, risoluzione di problemi complessi, pensiero critico, mentalità interdisciplinare.

## Skills (continued)

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Lingue	📖	Ottime competenze di lettura, scrittura e conversazione in inglese e italiano.
Coding	📖	c/c++ (avanzato), Matlab (avanzato), Python (avanzato), Lua (buono), SQL (beginner), ...
CAD	📖	Solid Edge (avanzato), Autodesk Fusion 360 (buono), ...
Misc.	📖	Ricerca accademica, insegnamento, consulenze, scrittura $\LaTeX$ .
Extra	📖	Pianista di musica jazz & classica, fotografia analogica, corsa e palestra, ...

## Skills

Cryogenic experiments, Granular materials characterization, Discrete Element Modeling (DEM)

## Education

**Post-Doc** UMR-CNRS 6112 Planetology and Geosciences Laboratory (Nantes, France), February 2024 to October 2024.

*Study of the cohesive properties of mixed ice powders: effect of salts and solid contaminants on the surface properties of the icy moons of Jupiter and Saturn.*

**Ph.D.** Planetology, Gustave Eiffel University (Bouguenais, France) and Nantes University (Nantes, France), December 2023.

Dissertation: *Study of the cohesive properties of ice powders: applications to the surface of the icy moons of Jupiter and Saturn.*

**M.Sc.** Planetology and Space Exploration, Paris Saclay University (Orsay, France), 2020.

Thesis: *Rheology of ice powders: application to icy bodies in the Solar System.*

**B.Sc.** Earth and Universe Sciences, Paris Saclay University (Orsay, France), 2018.

## Publications

*Book chapters*

A. Lagain, S. Bouley, D. Baratoux, C. Marmo, F. Costard, O. Delaa, A. Pio Rossi, M. Minin, G.K. Benedix, M. Ciocco, B. Bedos, A. Guimpier, E. Dehouck, D. Loizeau, A. Bouquety, J. Zhao, A. Vialatte, M. Cormau, E. Le Conte des Floris, F. Schmidt, P. Thollot, J. Champion, M. Martinot, J. Gargani, P. Beck, J. Boisson, N. Paulien, A. Séjourné, K. Pasquon, N. Christoff, I. Belgacem, F. Landais, B. Rousseau, L. Dupeyrat, M. Franco, F. Andrieu, B. Cecconi, S. Erard, B. Jabaud, V. Malarewicz, G. Beggiano, G. Janez, L. Elbaz, C. Ourliac, M. Catheline, M. Fries, A. Karamoko, J. Rodier, R. Sarian, A. Gillet, S. Girard, M. Pottier, S. Strauss, C. Chanon, P. Lavaud, A. Boutaric, M. Saviourat, E. Garret, E. Leroy, M.-C. Geffray, L. Parquet, M.-A. Delagoutte, O. Gamblin (2021). “Mars Crater Database: A participative project for the classification of the morphological characteristics of large Martian craters”, *Large Meteorite Impacts*

*Journal Articles*

- (1) B. Jabaud, R. Artoni, G. Tobie, E. Le Menn, P. Richard. “Cohesive properties of ice powders analogous to fresh plume deposits on Enceladus and Europa”, *Icarus*, 2024.
- (2) N. Le Becq, S. Conway, B. Jabaud, G. Tobie, R. Artoni. “A new model of crater degradation on Ceres involving ice sublimation and talus formation”, *Icarus*, 2024.
- (3) B. Jabaud, R. Artoni, E. Le Menn, V. Munoz Iglesias, G. Tobie, S. Conway. “Mechanical properties of salty ice powders as better analogues of Europa’s regolith”, *in prep.*
- (4) R. Artoni, P. Richard, E. Le Menn, G. Tobie, B. Jabaud, A. Pol. “Discrete numerical analysis of cohesive granular flow in a thin rotating drum: flow regimes and cohesion estimation”, *in prep.*

Conference/  
Workshop/  
Seminar  
Presentations

- “Cohesive properties of ice powders and mixtures as analogues of regoliths of icy worlds.” French Conference of Planetology and Exobiology Planetexobio2024, July 2024, Nantes, France (Oral presentation).
- “Development of cryogenic mechanical characterization for planetary analogues.” Experimentation and Instrumentation Workshop, June 2024, Rennes, France (Poster presentation)
- “Cohesive properties of ice powders and mixtures as analogues of regoliths of icy worlds.” Annual Division for Planetary Sciences – Europlanet Science Congress joint meeting, October 2023, San-Antonio, United States (Oral presentation)
- “Dynamical characterization of the cohesion of ice powders at very low temperatures.” International Congress on Particle Technology, September 2023, Nuremberg, Germany (Oral presentation)
- “Cohesive properties of fresh deposits analogues on Enceladus and Europa.” Lunar and Planetary Science Conference, March 2023, Houston, United States (Oral presentation)
- “Cohesion of ice powders at low temperature.” French Congress of Rheology, October 2022, Rennes, France (Oral presentation)
- “The icy regoliths of Enceladus and Europa: experimental study on analogues.” Europlanet Science Congress, September 2022, Granada, Spain (Oral presentation)



- “The icy regoliths of the Solar System: experimental and numerical study.” World Congress on Particle Technology, September 2022, Madrid, Spain (Oral presentation)
- “Rheology of ice powders and application to icy satellites.” International Space Science Institute meeting, July 2022, Bern, Switzerland (Oral presentation)
- “The icy regoliths of Enceladus and Europa: experimental and numerical study.” Quadrennial conference of the National Planetology Program, June 2022, Lyon, France (Poster presentation)
- “The icy regoliths of the Solar System: granular materials (un)like any others.” 17<sup>th</sup> Condensed Matter Days, August 2021, Rennes, France (Poster presentation)
- “The icy regoliths of the Solar System: powders (un)like any others.” Powder Science and Technology, Powders and Sintered Materials, July 2021, Saint-Etienne, France (Oral presentation)

#### Teaching Assistant Experience

X12G030 – Calculation tools for Geosciences (2023, Nantes University)

#### Student Supervision

- Co-Supervision of a 3-months Bachelor Thesis “Synthesis and Spectral Characterization of ice grains: application to the icy bodies of the Solar System.” by Ambre Priol at Nantes University (2021)
- Co-Supervision of a 6-months Master Thesis “Infrared signatures of ice powders: an experimental approach for application to Enceladus and Europa.” by Florian Picot at Nantes University (2022)
- Co-Supervision of a 6-months Master Thesis “Rheology of mixed ice-sand powders in cold conditions – applications to dwarf planet Ceres.” by Noé Le Becq at Nantes University (2023)

#### Science Outreach

- Tour guide for visits of the Planetary and Geosciences Laboratory (LPG, Nantes University), both for external visitors, middle school students or university students.
- Speaker for an outreach conference during the launch of the JUICE mission.
- Stand designer and animator at the “Fête de la Science” (French national outreach program), 2022, 2023 and 2024 edition.
- Stand animator at Nantes Astronomy Festival “De la Terre aux Étoiles”, 2024.

Computer Skills	Python, LAMMPS (DEM simulations, Molecular Dynamics Simulator adapted to granular materials), Blender (3D modeling)
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Language Skills	English – Fluent French – Mother tongue
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