

RAUFASTE Christophe
Professor
Institut de Physique de Nice, site Valrose
Université Côte d'Azur
Parc Valrose 06108 Nice cedex 2

Born on September 20th, 1980 in Hayange
French, 1 child
phone: +334 89 15 28 26
email: christophe.raufaste@unice.fr
web: <http://sites.unice.fr/site/raufaste/raufaste/>

EDUCATION

2017: "Habilitation à diriger les recherches", Université Côte d'Azur.

"Dynamique d'objets capillaires et écoulement aux interfaces libres".

committee: I. Cantat, C. Clanet, N. Vandewalle, F. Graner, M. Argentina, E. Villermaux

2004-2007: PhD supervised by F. Graner, Université Grenoble I.

"Rhéologie et imagerie des écoulements 2D de mousse : approche expérimentale, numérique et théorique".

PhD prize in 2008 awarded by the French Rheology Society

2003/2004: Master's degree in physics of liquids, Paris

2002/2003: "Agrégation de physique"

2000-2004: Student at ENS Lyon, physics department

PROFESSIONAL EXPERIENCE

since 2022: Full Professor, Université Côte d'Azur

2009-2022: Associate Professor, Université Nice Sophia Antipolis, section CNU 28.

2020: junior fellow of the Institut Universitaire de France

2018: sabbatical, 8 months, DAMTP, Cambridge, group of Pr. Ray Goldstein

2016-2020 : PEDS (bonus for doctoral supervision)

2012-2016 : PES (bonus for scientific excellence)

CNRS sabbatical, 6 months in 2014/2015 and 2015/2016

2007-2009: postdoc, group "Physics of Geological Processes", Univ. Oslo

2004-2007: PhD and teaching assistant, Université Grenoble I

SUPERVISION

Postdocs: Florence Haudin (2010-2011), Florence Gibouin (2016-2017), Li Fu (2020-2022), Ludovic Keiser (2022-2024), Antoine Monier (2022-2024)

PhD students: Geoffroy Kirstetter (2010-2014), Alexandre Cohen (2011-2015), Christophe d'Angelo (2018-2021), Jesus Sanchez (2018-2021), Guillaume Giombini (2019-), Florian Schott (2020-, Lunds Univ.), David Paulovics (2021-)

Master students: Mathieu Pellegrin (M2, 2011), Damien Scandola (M1, 2013), Marine Borocco (M2, 2014), Alexandre Barzyk (M1, 2014), Abidi Bilel (M1, 2016), Christophe d'Angelo (M1, 2017), Christophe d'Angelo (M2, 2018), Guillaume Giombini (M2, 2019), William Bontemps (M1, 2019), Lisa Sicard (M2, 2020), Simeon Djambo (M1, 2020), Leo Guschemann (M1, 2020), David Paulovics (M2, 2021), François-Xavier Gauci (M2, 2022)

ADMINISTRATION

since 2021: deputy director of the Physics Institute of Nice (INPHYNI)

since 2021: member of the steering committee of the GDR Mephy. <https://blog.espci.fr/mephy/contact/>

since 2020: team leader of the “Complex Fluids” group

since 2018: member of the steering committee of the Master OAM (“Ondes, Atomes et Matière”, Université Côte d’Azur). <http://master-oam.unice.fr/>

2015-2021: elected member of the standing committee on human resources in physics (Univ. Nice): advisory body that advises on the recruitment strategy (Associate Professors and Professors) in physics at the University of Nice.

2011-2020: responsible for the PhD-students at the institute and at the doctoral school.

2011-2020: elected member of the Institute Council

RESEARCH MANAGEMENT

since 2020: team leader of the “Complex Fluids” group (7 permanent researchers, 2 postdocs, 3 PhD students in average)

since 2017: principal investigator (with F. Celestini) of the superpropulsion research program. 3 senior researchers and 1 theoretical physicist from the Niels Bohr Institute involved, 2 PhDs funded since 2018, 6 articles published

since 2011: principal investigator of the liquid foam program. 5 senior researchers involved, 2 PhDs defended, 1 postdoc, 16 articles published, 1 keynote and 1 invited presentation in international conference, 1 invited lecture

PROJECTS FUNDED AS PRINCIPAL INVESTIGATOR

2022-2024: “Dynamique d’interfaces libres en mécanique des fluides avec une application en physique des plantes et une en micro fluidique fondamentale et appliquée”. 1 postdoc funded by the Idex UCA Jedi by the call AIDES INDIVIDUELLES JEUNES CHERCHEURS 2021, 107 k€.

2020-2024: “Stability of foam films: marginal regeneration and drainage (DrainFilm)” funded by the ANR, three partners (INPHYNI, LPS Orsay, IPR Rennes), 411k€.

2019-2022: “Use of the superpropulsion effect to optimize ballistic throws”. 1 PhD funded by the Directorate General of Armaments, 118k€.

2018-2020: “Fast infrared imaging for thermohydrodynamics”. 95k€ obtained from several sources (CNRS/UNS/Doebelin/RégionPACA) to get an infrared high-speed camera.

2010-2016: 3 projects about X-ray tomography experiments on foam flow. French-Swiss collaboration, four partners (INPHYNI, SLS, ENS LYON, LIPHY), 5 researchers.

“Resolving three dimensional foam flow”, 2015-2016, 49k€ in beam time.

“Structural rearrangements and flow in 3D liquid foams”, 2011-2013, 59k€ in beam time.

“Dynamics of gas injection inside 3D liquid foams”, 2010-2011, 49k€ in beam time.

PARTNER OF FUNDED PROJECTS

2021-2025: “Impinging micro-jets”, PI M. Argentina (UCA). 418 k€ funded by the ANR, two partners (INPHYNI, IEMN), 6 researchers.

2020-2025: “Multi-scale analysis of structural rearrangements in a flowing liquid foam using X-ray tomographic microscopy”, PI R. Mokso (MaxIV, Lund University). 355 k€ from the Swedish Research

Council (SRC). X-ray tomography experiments and analysis on foam flow. French-Swedish collaboration, four partners (MaxIV, INPHYNI, ENS LYON, LIPHY), 6 researchers.

2020-2023: “Model-based and deep learning methods for robotic control”, PI G. Allibert. 190k€ (UCA IDEX). Transdisciplinary project between the physics and informatics institutes of Nice. Two partners (INPHYNI, I3S), 3 researchers. Responsible for the experiments with the robotic fish.

2016-2018: “Swimming Underwater roBOT”, PI M. Argentina. 77k€ (UCA IDEX), 3 researchers. Responsible for the experiments.

2010-2013: “Cavitation and bubble dynamics”, PI X. Noblin. 223k€ (ANR), 4 researchers. Responsible for 1 part of 3.

MOBILITY AND VISITS FOR COLLABORATION

2019: Lavrentyev Institute of Hydrodynamics, Russia, collaboration E. Ermanyuk (2 weeks)

2018: DAMTP, University of Cambridge, sabbatical, group of Pr. R. Goldstein (8 months)

2018: Aberystwyth University, UK, collaboration S. J. Cox (2 weeks)

2012-2016: Niels Bohr Institute, collaboration J. Mathiesen (2x 1 week)

2011-2019: ENS Lyon, collaboration S. Santucci (4x 1 week)

2011-2016: IPR Rennes, collaboration B. Dollet (3x1 week)

Sep. 2011: PSI Villigen, Switzerland, collaboration R. Mokso (2 weeks)

2008-2009: University of Oslo, Norway, postdoc (2 years)

Jun. 2007: Aberystwyth University, UK, collaboration S. J. Cox (2 weeks)

Mar. 2005: Los Alamos National Laboratory, US, collaboration Yi Jiang (1 month)

PHD COMMITTEES (14 external committees, 9 as reviewer)

2022 (examiner) Lauren Rose, LP ENS Lyon - ENS Lyon

2022 (examiner) Chiara Guidolin, LPS Orsay - Université Paris Saclay

2022 (reviewer) Aditya Jha, PMMH - PSL - ESPCI

2021 (reviewer) Carlos Arauz Moreno, LIPHY Grenoble - Université Grenoble-Alpes

2020 (reviewer) Manon Marchand, LPS Orsay - Université Paris Saclay

2020 (reviewer) Lucile Favreau, LP ENS Lyon - ENS Lyon

2019 (reviewer) Jonas Miguet, LPS Orsay - Université Paris Saclay

2019 (reviewer) Quentin Raimbaud, IPR Rennes - Université de Rennes

2019 (examiner) Goce Koleski, LOMA - Université de Bordeaux

2019 (examiner) David Gross, INPHYNI - Université Côte d'Azur

2018 (reviewer) Armelle Keiser, PMMH - PSL - ESPCI

2018 (reviewer) Quentin Ehlinger, ILM - Université de Lyon

2014 (examiner) Sébastien Kosgodagan Acharige, MSC - Université Paris Diderot

2013 (reviewer) Kevin Mader, ETH Zürich

ORGANIZATION OF CONFERENCES

Rencontres du non linéaire, 29-31 March 2022, Paris

<http://nonlineaire.univ-lille1.fr/SNL/>

Member of the scientific committee

Fluids and Complexity II, 29-30 Nov. 2021, Nice

<https://fcomplexity2.sciencesconf.org/>

Member of the scientific committee

Waves Côte d'Azur, 4-7 June 2019, Nice

<http://wavescotedazur.org/>

Member of the organization and scientific committees

workshop "Mousses, films et effets Marangoni", 27-29 March 2019, Rennes

<https://ipr.univ-rennes1.fr/agenda/workshop-mousses-films-et-effets-marangoni>

Member of the scientific committee

LECTURES, COMMUNICATIONS, ABSTRACTS, SEMINARS

2 invited lectures (summer school and University)

1 keynote and 1 invited presentation at international conferences

15 selected oral presentations at international conferences

11 selected oral presentations at national conferences

76 abstracts at national (25) and international (51) conferences

16 invited seminars in institutes (9 in France and 7 abroad)

PUBLICATIONS

Orcid ID : 0000-0003-4328-7438

ResearcherID : R-2217-2017

44 articles published

INTERNATIONAL PEER-REVIEWED JOURNALS

[44] Dynamics of Frost Propagation on Breath Figures

D. Paulovics, C. Raufaste, T. Frisch, C. Claudet and F. Celestini, *Langmuir* 38, 2972–2978 (2022).

[43] Use of compliant actuators for throwing rigid projectiles G. Giombini, J. Mathiesen, C. D'Angelo, M. Argentina, C. Raufaste and F. Celestini, *Phys. Rev. E* 105, 025001 (2022).

[42] Geometrical Evolution of Surfaces Dynamics of the Gaussian Curvature of a Collapsing Soap Film R. E. Goldstein, A. I. Pesci, C. Raufaste and J. D. Shemilt, *Phys. Rev. E* 104, 035105 (2021).

[41] Actuating water droplets on liquid infused surfaces: A rickshaw for droplets C. Raufaste, S. J. Cox and F. Celestini, *Phys. Rev. Fluids* 6, 083603 (2021).

[40] Effect of gravity on the orientation and detachment of cubic particles adsorbed at soap film or liquid interfaces I. T. Davies and C. Raufaste, *Soft Matter* 17, 6964–6971 (2021).

[39] Proprioceptive mechanism for bioinspired fish swimming J. Sanchez-Rodriguez, F. Celestini, C. Raufaste and M. Argentina, *Phys. Rev. Lett.* 126, 234501 (2021).

The paper is listed as one of the editors' suggestions. It is featured in [Physics: Robo-Fish Replicates Real Swimming Action](#) and in [Phys.org: A proprioceptive mechanism to enable fish-like swimming in robots](#).

[38] Impact dynamics of composite elastorigid projectiles onto solid surfaces C. D'Angelo, L. Viennot, M. Argentina, F. Celestini and C. Raufaste, *Phys. Rev. E* 103, 053005 (2021).

[37] Drag analysis with a self-propelled flexible swimmer

D. Gross, Y. Roux, C. Raufaste and M. Argentina, accepted for publication in *Phys. Rev. Fluids*

[36] Contact layer as a propelling advantage in throwing

F. Celestini, J. Mathiesen, M. Argentina and C. Raufaste, *Phys. Rev. Applied* 14, 044026 (2020).

The paper is featured in [Physics: Springy Material Boosts Projectile Performance](#) and in [Le Monde: Du gel pour transformer les solides en excellents sauteurs](#).

[35] Quasi two-dimensional foam flow through and around a permeable obstacle

N. Shmakova, T. Chevalier, A. Puisto, M. Alava, C. Raufaste and S. Santucci, *Phys. Rev. Fluids* 5, 093301 (2020).

[34] A minimal model of self propelled locomotion

J. Sanchez-Rodriguez, C. Raufaste and M. Argentina, J. Fluids Struct. 125, 103071 (2020).

[33] Stress-Induced Dinoflagellate Bioluminescence at the Single Cell Level

M. Jalaal, N. Schramma, A. Dode, H. de Maleprade, C. Raufaste, R. E. Goldstein, Phys. Rev. Lett. 125, 028102 (2020).

The paper is listed as one of the editors' suggestions. It is featured in Physics: Flashes bright when squeezed tight: How single-celled organisms light up the oceans and in Physics Today: Mechanically stressed phytoplankton light up.

[32] Ferrofluid Leidenfrost droplets. C. D'Angelo, C. Raufaste, P. Kuzhir, F. Celestini. Soft Matter 15, 5945–5950 (2019).

[31] Experimental characterization of droplet adhesion : the Ejection Test Method (ETM) applied to

surfaces with various hydrophobicity. G. Ramos Chagas, F. Celestini, C. Raufaste, A. Gaucher, D. Prim, S. Amigoni, F. Guittard, T. Darmanin.

J. Phys. Chem. A 122, 8693–8700 (2018).

[30] Study of the thrust-drag balance with a swimming robotic fish. F. Gibouin, C. Raufaste, Y. Bouret, M. Argentina.

Phys. fluids 30, 091901 (2018).

[29] Foam flows through a local constriction. T Chevalier, J. Koivisto, N. Shmakova, M. J. Alava, A. Puisto., C. Raufaste, S. Santucci.

J. Phys. : Conf. Ser. 925, 012025 (2017).

[28] Melde's experiment on a vibrating liquid foam microchannel. A. Cohen, N. Fraysse,

C. Raufaste.

Phys. Rev. Lett. 119, 238001 (2017).

The paper is featured in Physics with a Focus story written by Michael Schirber: Liquid String Vibrations.

[27] Superpropulsion of droplets and soft elastic solids. C. Raufaste, G. Ramos Chagas,

T. Darmanin, C. Claudet, F. Guittard, F. Celestini.

Phys. Rev. Lett. 119, 108001 (2017).

The paper is listed as one of the editors' suggestions from Physical Review Letters and is featured in Physics with a Focus story written by Philip Ball: Superpropulsion of liquid drops. Other highlights in Physics World (IOP). Pour la Science and Science & vie.

[26] Solitary-like waves in a liquid foam microchannel. Y. Bouret, A. Cohen, N. Fraysse, M. Argentina and C. Raufaste.

Phys. Rev. F 1, 043902 (2016).

[25] Bubble dynamics inside an outgassing hydrogel confined in a Hele-Shaw cell. F. Haudin, X. Noblin, Y. Bouret, M. Argentina and C. Raufaste. Phys. Rev. E 94, 023109 (2016).

[24] Reactive Leidenfrost droplets. C. Raufaste, Y. Bouret and F. Celestini. Europhys. Lett. 114, 46005 (2016).

The paper is listed as one of the editors' choices for 2016

[23] Scale selection in columnar jointing. A. Christensen, C. Raufaste, M. Misztal, F. Celestini, M. Guidi, C. Ellegaard and J. Mathiesen. J. Geophys. Res. Solid Earth 121, 1462–1482 (2016).

[22] Three-dimensional foam flow resolved by fast X-ray tomographic microscopy. C. Raufaste, B. Dollet, K. Mader, S. Santucci and R. Mokso. Europhys. Lett. 111, 38004 (2015).

[21] Drop coalescence and liquid flow in a single Plateau border. A. Cohen, N. Fraysse and C. Raufaste. Phys. Rev. E 91, 053008 (2015).

[20] Hole growth dynamics in a two dimensional Leidenfrost droplet. C. Raufaste, F. Celestini, A. Barzyk and T. Frisch. Phys. fluids 27, 031704 (2015).

[19] One dimensional capillary jumps. M. Argentina, A. Cohen, Y. Bouret, N. Fraysse and C. Raufaste. J. Fluid Mech. 765, 1–16 (2015).

The paper was selected for the J. Fluid Mech. cover, issue 765, Feb. 2015

[18] Rheology of aqueous foams. B. Dollet and C. Raufaste. C. R. Phys. 15, 731–747 (2014).

[17] Inertial mass transport and capillary hydraulic jump in a liquid foam microchannel. A. Cohen, N. Fraysse, J. Rajchenbach, M. Argentina, Y. Bouret and C. Raufaste. Phys. Rev. Lett. 112, 218303 (2014).

The paper is listed as one of the editors' suggestions from Physical Review Letters and is highlighted by the Physics Institute of the CNRS.

[16] Two dimensional Leidenfrost droplets in a Hele Shaw cell. F. Celestini, T. Frisch, A. Cohen, C. Raufaste, L. Duchemin and Y. Pomeau. Phys. fluids 26, 032103 (2014).

The paper is listed as one of the research highlights from Physics of Fluids

[15] Deformation of a free interface pierced by a tilted cylinder : variation of the contact angle. C. Raufaste and S. Cox.

Colloids Surf. A 438, 126–131 (2013).

[14] Quantitative 3D characterization of cellular materials : segmentation and morphology of Foam. K. Mader, R. Mokso, C. Raufaste, B. Dollet, S. Santucci, J. Lambert, M. Stampanoni. Colloids Surf. A 415, 230–238 (2012).

[13] Deformation of a free interface pierced by a tilted cylinder. C. Raufaste, G. Kirstetter, F. Celestini and S. J. Cox. Europhys. Lett. 99, 24001 (2012).

[12] Jet impact on a soap film. G. Kirstetter, C. Raufaste and F. Celestini. Phys. Rev. E 86, 036303 (2012).

The study inspired the problem Jet and film in the Young Physicists Tournament 2013

[11] The mechanism of porosity formation during solvent-mediated phase transformations. C. Raufaste, B. Jamtveit, T. John, P. Meakin and D. K. Dysthe. Proc. R. Soc. London A 467, 1408–1426 (2011).

[10] Understanding and predicting viscous, elastic, plastic flows. I. Cheddadi, P. Saramito, B. Dollet, C. Raufaste and F. Graner. Eur. Phys. J. E 34, 1–15 (2011).

[9] Morphological transitions in partially gas-fluidized granular mixtures. A. Nermoden, C. Raufaste, S. D. de Villiers, E. Jettestuen, P. Meakin, D. K. Dysthe. Phys. Rev. E 81, 061305 (2010).

[8] Discrete rearranging disordered patterns : Prediction of elastic and plastic behavior, and application to two-dimensional foams. C. Raufaste, S. J. Cox, P. Marmottant and F. Graner. Phys. Rev. E 81, 031404 (2010).

[7] Dissipation in quasi-two-dimensional flowing foams. C. Raufaste, A. Foulon and B. Dollet. Phys. fluids 21, 053102 (2009).

[6] Numerical modelling of foam Couette flows. I. Cheddadi, P. Saramito, C. Raufaste, P. Marmottant and F. Graner. Eur. Phys. J. E 27, 123–133 (2008).

[5] Discrete rearranging disordered patterns, part II: 2D plasticity, elasticity and flow of a foam. P. Marmottant, C. Raufaste and F. Graner. Eur. Phys. J. E 25, 371–384 (2008).

[4] Discrete rearranging disordered patterns, part I: Robust statistical tools in two or three dimensions. F. Graner, B. Dollet, C. Raufaste and P. Marmottant.

Eur. Phys. J. E 25, 349–369 (2008).

[3] Yield drag in a 2D foam flow around a circular obstacle: Effect of liquid fraction. C. Raufaste, B. Dollet, S. J. Cox, Y. Jiang and F. Graner.
Eur. Phys. J. E 23, 217-228 (2007).

[2] 2D flow of foam around obstacles: force measurements. B. Dollet, F. Elias, C. Quilliet, C. Raufaste, M. Aubouy and F. Graner.
Phys. Rev. E 71, 031403 (2005).

[1] Penetration of negatively buoyant jet in a miscible liquid. P. Philippe, C. Raufaste, P. Kurowski and P. Petitjeans.
Phys. fluids 17, 053601 (2005).

INVITED ARTICLE IN A NATIONAL JOURNAL

Rhéologie et imagerie des écoulements 2D de mousse.
C. Raufaste.
Rhéologie 14, 13-14 (2008).

INVITED REVIEW

Rheology of aqueous foams.
B. Dollet and C. Raufaste.
C. R. Phys. 15, 731–747 (2014).

THESES

PhD

Rhéologie et imagerie des écoulements 2D de mousse : approche expérimentale, numérique et théorique. Université de Grenoble, 2007.

Committee: S.J. Cox, I. Cantat, S. Cohen-Addad, A. Ammar, F. Graner.

<http://tel.archives-ouvertes.fr/tel-00193248/fr/>

“Habilitation à diriger les recherches”

Dynamique d’objets capillaires et écoulement aux interfaces libres. Univ. Côte d’Azur, 2017.

committee: I. Cantat, C. Clanet, N. Vandewalle, F. Graner, M. Argentina, E. Villermaux

<https://tel.archives-ouvertes.fr/tel-01657142>

LECTURES, PRESENTATIONS, SEMINARS, ABSTRACTS

INVITED LECTURES

April 2021, Films, Bubbles and Foam, University of Liège, one week invited lecture

https://www.cesam.uliege.be/cms/c_7055854/fr/lecon-inaugurale-19/04/21-films-bubbles-and-foam-par-ass-prof-christophe-raufaste-universite-cote-d-azur-nice

June 2014, Gouttes en mouillage nul, summer school “aux rencontres de Peyresq”.

KEYNOTE AND INVITED PRESENTATIONS AT INTERNATIONAL CONFERENCES

Jul. 2018 (keynote) EUFOAM 2018, Liège, Belgium. Stability and relaxation dynamics of a single Plateau border.

Sep. 2011 (invited) Jump 2011, PSI user meeting, Villigen, Switzerland. Imaging and mechanics of liquid foam flows.

INVITED SEMINARS

Jul. 2019, Lavrentyev Institute of Hydrodynamics, Novosibirsk

Apr. 2019, LiPhy, Grenoble

Nov. 2018, Laboratoire Matière et Systèmes Complexes, Paris

Feb. 2018, University of Cambridge, DAMTP

Feb. 2018, University of Aberystwyth

Jan. 2017, Observatoire de la Côte d'Azur, Nice

May 2016, Institut de Physique de Rennes

Apr. 2016, ENS Lyon

Apr. 2016, Niels Bohr Institute, Copenhagen

Nov. 2014, Matière et Systèmes Complexes, Paris

Dec. 2012, Niels Bohr Institute, Copenhagen

Jan. 2011, Institut de Physique de Rennes

Feb. 2010, Laboratoire J.A. Dieudonné, Nice

Feb. 2010, Laboratoire de Physique de la Matière Condensée, Nice

Jun. 2007, Physics of Geological Processes, Oslo

May 2007, Institute of Chemistry, Graz

SELECTED PRESENTATIONS AT INTERNATIONAL CONFERENCES

Jul. 2020, Eufoam 2020, Aberystwyth (virtual), Geometrical evolution during the collapse of soap-film catenoids

Jun. 2019, Waves Côte d'Azur, Nice, Nonlinear waves in Plateau borders.

Dec. 2018, Fluids and complexity, Nice, The superpropulsion effect with droplets and soft elastic projectiles.

Jul. 2018, Eufoam 2018, Liège, Stability and relaxation dynamics of a single Plateau border.

Dec. 2017, Nice Nonlinearities, Nice, Flow and nonlinearities inside the liquid foam microchannels.

Nov. 2017, APS DFD Denver, Hydraulic jumps in the liquid foam microchannels.

Mar. 2015, FloMat, Rome, Inertial flows in liquid foam microchannels.

Jul. 2012, Eufoam 2012, Lisbon, Jet refraction across a soap film.
 Jan. 2012, CECAM workshop, dissipative rheology of foams, Dublin, Drop coalescence along a Plateau Border.
 Jan. 2012, CECAM workshop, dissipative rheology of foams, Dublin, Impact of a liquid jet on a soap film.
 Sep. 2011, Liquid Matter, Vienna, Interaction of a liquid jet with a soap film.
 May 2011, IUTAM Symposium : Mechanics of liquid and solid foams, Austin, US. Interaction of a liquid jet with a liquid foam: a film scale study.
 Jul. 2010, Eufoam, Borovets, Bulgaria, Orientational effects in the flow of liquid foams.
 Jun. 2010, Cryspom II, Brienz, Switzerland, Crystal growth and porosity formation during solvent-mediated phase transformations.
 Jan. 2010, 29th Nordic Geological Winter Meeting, Oslo, Mechanisms of permeability enhancement during chemical alteration.

SELECTED PRESENTATIONS AT NATIONAL CONFERENCES

Jan. 2017, Journées Niçoises de Mécanique des Fluides
 Aug. 2015 , congrès général SFP, Strasbourg
 Jun. 2015, GDR Mephy, Agay
 Nov. 2012, GDR Liquides aux Interfaces, Lyon
 Sep. 2012, GDR Mousse, Paris
 Jun. 2012, GDR Mephy, Agay
 Jun. 2011, Capillary day, Nice
 Feb. 2010, Journées Niçoises de Mécanique des Fluides
 Aug. 2009, congrès français de mécanique, Marseille
 Aug. 2007 , congrès français de mécanique, Grenoble

SELECTED ABSTRACTS AT CONFERENCES

[76] Mar 2022, Rencontres du non linéaire
 Frost propagation on breath figures
 D. Paulovics, C. Raufaste*, T. Frisch, C. Claudet, F. Celestini

[75] Mar 2022, Workshop systèmes à 3 phases du GDR MEPHY
 Frost propagation on breath figures
 D. Paulovics, C. Raufaste, T. Frisch, C. Claudet, F. Celestini

[74] Nov. 2021, Fluids and Complexity II, Nice
 Swimming gait optimized by Machine Learning
 L. Fu, J. Sanchez-Rodriguez, S. Israilov, G. Allibert, C. Raufaste and M. Argentina

[73] Nov. 2021, Fluids and Complexity II, Nice
 Characterization of bubbles deformations and interactions inside a liquid foam flowing through a constriction
 F. Schott, C. Raufaste, B. Dollet, S. Santucci, C. Claudet and R. Mokso

[72] Nov. 2021, Fluids and Complexity II, Nice
 Swimming gait driven by proprioception
 J. Sanchez-Rodriguez, C. Raufaste and M. Argentina

- [71] Aug. 2021, 25th Congress ICTAM Milano 2020+1 Virtual
A simple model for fish locomotion: from kinematics to proprioceptive driving.
J. Sánchez-Rodríguez, C. Raufaste, M. Argentina.
- [70] Apr. 2021, AERC 2021, Annual European Rheology Conference in Cyberspace (virtual)
Elastic overshoot in liquid foam flows through and around a permeable defect
L. Rose, B. Dollet, C. Raufaste and S. Santucci
- [69] Mar. 2021, Rencontre du Non Linéaire 2021
Superpropulsion of slender elastic objects
G. Giombini, F. Celestini and C. Raufaste
- [68] Mar. 2021, APS March Meeting 2021 (virtual)
A proprioceptive mechanism for swimming
J. Sanchez Rodriguez*, C. Raufaste and M. Argentina
- [67] Mar. 2021, APS March Meeting 2021 (virtual)
Intermediate soft layer for optimizing throws
G. Giombini, J. Mathiesen, M. Argentina, C. D'Angelo, F. Celestini and C. Raufaste
- [66] Mar. 2021, APS March Meeting 2021 (virtual)
Impacts of bi-layered elastic projectiles
C. D'Angelo, F. Celestini and C. Raufaste
- [65] Jul. 2020, Eufoam 2020, Aberystwyth (virtual)
Interaction between a descending solid object and a soap film
I.T. Davies and C. Raufaste
- [64] Jul. 2020, Eufoam 2020, Aberystwyth (virtual)
Liquid foam flow through/around a permeable defect
L. Rose, N. Shmakova, C. Raufaste, B. Dollet, S. Santucci
- [63] Jul. 2020, Eufoam 2020, Aberystwyth (virtual)
Geometrical evolution during the collapse of soap-film catenoids
C. Raufaste, A.I. Pesci, J.D. Shemilt, S.J. Cox, R.E. Goldstein
- [62] Nov 2019, APS DFD 2019, Seattle
Swimming gait driven by proprioceptive feedback
J. Sanchez-Rodríguez, C. Raufaste, M. Argentina
- [61] Nov. 2019, APS DFD 2019, Seattle,
A proprioceptive robotic swimmer
M. Argentina, J. Sanchez Rodriguez, C. Raufaste
- [60] Nov. 2019, GDR SLAMM, Roscoff
Impacts of bicomposite projectiles
C. D'Angelo, F. Celestini and C. Raufaste
- [59] Jun. 2019, Waves Côte d'Azur, Nice
Nonlinear waves in Plateau borders
C. Raufaste
- [58] Mar. 2019, Complex Days, Nice
The complex dynamics of bouncing
C.D'Angelo, C.Raufaste and F.Celestini
- [57] Mar. 2019, Complex Days, Nice

- Bounces of bicomposite object
C. D'Angelo, C. Raufaste and F. Celestini
- [56] Jan. 2019, Journée de Physique Statistique et de la Matière Molle, Paris
Impacts of bicomposite projectiles
C. D'Angelo, C. Raufaste and F. Celestini
- [55] Dec. 2018, Fluids and complexity, Nice
The superpropulsion effect with droplets and soft elastic projectiles
C. Raufaste, G. Ramos Chagas, T. Darmanin, C. Claudet, F. Guittard, F. Celestini
- [54] Nov. 2018, APS DFD 2018, Atlanta, US
Study of the thrust-drag balance with a swimming robotic fish
M. Argentina, F. Gibouin, C. Raufaste
- [53] Jul. 2018, Eufoam 2018, Liège
Stability and relaxation dynamics of a single Plateau border
C. Raufaste
- [52] Dec. 2017, Nice Nonlinearities, Nice
Flow and nonlinearities inside the liquid foam microchannels
A. Cohen, N. Fraysse, J. Rajchenbach, Y. Bouret, M. Argentina, C. Raufaste
- [51] Nov. 2017, APS DFD 2017, Denver, US
Scaling laws for a compliant biomimetic swimmer
F. Gibouin, C. Raufaste, Y. Bouret, M. Argentina
- [50] Nov. 2017, APS DFD 2017, Denver, US
Hydraulic jumps in the liquid foam microchannels
C. Raufaste, A. Cohen, N. Fraysse, J. Rajchenbach, Y. Bouret, M. Argentina
- [49] Jan. 2017, Journées Niçoises de Mécanique des Fluides, Nice
Inertial dynamics of a liquid string
A. Cohen, N. Fraysse, M. Argentina, Y. Bouret, C. Raufaste
- [48] June 2016, Statistical physics of materials, Aussois
Foams imbibition in a fracture
T. Chevalier, M. J. Alava, A. Puisto, C. Raufaste, S. Santucci
- [47] August 2015, congrès annuel SFP, Strasbourg
Two dimensional Leidenfrost droplets in a Hele-Shaw cell
F. Celestini, A. Cohen, A. Barzyk, C. Raufaste, T. Frisch, L. Duchemin, Y. Pomeau
- [46] June 2015, GDR Mephy, Agay
Inertial flow in a Plateau Border
A. Cohen, N. Fraysse, J. Rajchenbach, M. Argentina, Y. Bouret, C. Raufaste
- [45] June 2015, GDR Mephy, Agay
2D Leidenfrost droplet in a Hele-Shaw cell
F. Celestini, A. Cohen, A. Barzyk, C. Raufaste, T. Frisch, L. Duchemin, Y. Pomeau
- [44] March 2015, FloMat (Flowing Matter across the scales), Rome, Italy
Inertial flows in liquid foam microchannels
A. Cohen, N. Fraysse, J. Rajchenbach, M. Argentina, Y. Bouret, C. Raufaste
- [43] August 2014, Condensed Matter in Paris 2014, JMC 14 - CMD 25
Capillary-hydraulic jump in liquid foams

- A. Cohen, N. Fraysse, J. Rajchenbach, M. Argentina, Y. Bouret, C. Raufaste
- [42] July 2014, Eufoam 2014, Thessaloniki, Greece
Capillary hydraulic jump in a Plateau border
A. Cohen, N. Fraysse, J. Rajchenbach, M. Argentina, Y. Bouret, C. Raufaste
- [41] July 2014, Eufoam 2014, Thessaloniki, Greece
Four dimensional foam studies at the micrometer scale
R. Mokso, K. Mader, B. Dollet, S. Santucci, G. Lovric, C. Raufaste
- [40] June 2013, GDR Mousse, Paris
Bord de Plateau en régime harmonique
A. Cohen, N. Fraysse, J. Rajchenbach, C. Raufaste
- [39] May 2013, workshop on Patterns and hydrodynamic instabilities in reactive systems, Brussels, Belgium
Highly ordered pattern formation during chemical alterations
C. Raufaste, B. Jamtveit, T. John, P. Meakin, D. K. Dysthe
- [38] November 2012, GDR Liquides aux Interfaces, Lyon
Imbibition inside a flexible pore
A. Cohen, N. Fraysse, J. Rajchenbach, C. Raufaste
- [37] September 2012, GDR Mousse, Paris
Fast dynamics in liquid foams
A. Cohen, G. Kirstetter, F. Celestini, N. Fraysse, J. Rajchenbach, C. Raufaste
- [36] August 2012, Journée de la Matière Condensée, Montpellier
Bubble dynamics in complex fluids
F. Haudin, C. Raufaste, X. Noblin
- [35] July 2012, Eufoam 2012, Lisbon, Portugal
Jet refraction across a soap film
C. Raufaste, G. Kirstetter, F. Celestini, S. Cox
- [34] July 2012, Eufoam 2012, Lisbon, Portugal
Drop coalescence on a single Plateau border
A. Cohen, N. Fraysse, J. Rajchenbach, C. Raufaste
- [33] July 2012, Eufoam 2012, Lisbon, Portugal
Stretching the limits of 4D observation of foam dynamics
R. Mokso, K. Mader, B. Dollet, S. Santucci, C. Raufaste
- [32] July 2012, Eufoam 2012, Lisbon, Portugal
Linking structure and flow inside 3D foams
S. Santucci, K. Mader, R. Mokso, B. Dollet, C. Raufaste
- [31] July 2012, Eufoam 2012, Lisbon, Portugal
Automated, high throughput structural characterization of liquid foams
K. Mader, R. Mokso, C. Raufaste, B. Dollet, S. Santucci, M. Stampanoni
- [30] June 2012, GDR Mephy, Agay
Morphologies and mechanisms during chemical alterations
C. Raufaste, B. Jamtveit, T. John, P. Meakin, D. K. Dysthe
- [29] June 2012, GDR Mephy, Agay
Coalescence de gouttes dans un bord de Plateau

- A. Cohen, N. Fraysse, J. Rajchenbach, C. Raufaste
- [28] Jan. 2012, CECAM workshop, dissipative rheology of foams
Drop coalescence along a Plateau Border
A. Cohen, N. Fraysse, C. Raufaste
- [27] Jan. 2012, CECAM workshop, dissipative rheology of foams
Impact of a liquid jet on a soap film
G. Kirstetter, C. Raufaste, F. Celestini
- [26] Sep. 2011, Jump 2011, PSI user meeting, Villigen, Switzerland
Imaging and mechanics of liquid foam flows
K. Mader, R. Mokso, B. Dollet, S. Santucci, C. Raufaste
- [25] Sep. 2011, Liquid Matter, Wien, Austria
Interaction of a liquid jet with a soap film
G. Kirstetter, C. Raufaste, F. Celestini
- [24] Sep. 2011, Liquid Matter, Wien, Austria
Bubble dynamics in complex fluids
F. Haudin, C. Raufaste, X. Noblin
- [23] Sep. 2011, Liquid Matter, Wien, Austria
Role of the fluid and porosity formation during solvent-mediated phase transformations
C. Raufaste, B. Jamtveit, T. John, P. Meakin, D.K. Dysthe
- [22] July 2011, SFP, Bordeaux, France
Impact d'un jet sur un film liquide
G. Kirstetter, C. Raufaste, F. Celestini, J. Rajchenbach
- [21] June 2011, Capillary day, Nice, France
Interaction of a liquid jet with a soap film
G. Kirstetter, C. Raufaste, F. Celestini
- [20] May 2011, IUTAM Symposium: Mechanics of liquid and solid foams, Austin, US
Interaction of a liquid jet with a liquid foam : a film scale study
C. Raufaste, G. Kirstetter, F. Celestini
- [19] Jan. 2011, 31èmes Journées de Physique Statistique, Paris, France
Impact d'un jet sur un film liquide
G. Kirstetter, F. Celestini, C. Raufaste, J. Rajchenbach
- [18] Jan. 2011, Geological carbon capture & storage in mafic and ultramafic rocks, IODP/ICDP
Workshop on the role of oceanic and continental scientific drilling, Muscat, Oman
Physical feedbacks during mineral carbonation: Field observations, experiments, and models
B. Jamtveit, A. Malthe-Sørenssen, H. Austrheim, A. Røyne, C. Raufaste
- [17] Jul. 2010, Eufoam 2010, Borovets, Bulgaria
Orientational effects in the flow of liquid foams
C. Raufaste, S.J. Cox, P. Marmottant, F. Graner
- [16] June 2010, Crispom II, Brienz, Switzerland
Crystal growth and porosity formation during solvent-mediated phase transformations
C. Raufaste, B. Jamtveit, T. John, D. K. Dysthe
- [15] June 2010, Crispom II, Brienz, Switzerland
Salt crystallization induced by evaporation in porous media

- M. Angeli, D. K. Dysthe, C. Raufaste
- [14] Jan. 2010, 29th Nordic Geological Winter Meeting, Oslo, Norway
Mechanisms of permeability enhancement during chemical alteration
C. Raufaste, J. Mathiesen, B. Jamtveit, T. John, D. K. Dysthe
- [13] Jan. 2010, 29th Nordic Geological Winter Meeting, Oslo, Norway
The Andean Geotrail (1): A scientific adventure
S. Caroline, G. Olivier, C. Raufaste, K. Mair
- [12] Dec. 2009, AGU fall meeting 2009, San Francisco, US
The Andean Geotrail (1): A scientific adventure
S. Caroline, G. Olivier, C. Raufaste, K. Mair
- [11] Aug. 2009, 19th french congress of mechanics, Marseille, France
Volume changes in solids induced by chemical alteration
C. Raufaste, J. Mathiesen, A. Røyne, D. K. Dysthe, A. Malthé-Sørenssen, B. Jamtveit
- [10] Aug. 2009, 19th french congress of mechanics, Marseille, France
Evaporation et cristallisation de sels solubles dans un réseau poreux modèle
M. Angeli, C. Raufaste, D. K. Dysthe
- [9] May 2009, the 22nd Kongsberg seminar, Kongsberg, Norway
Pattern formation in a fluidized bimodal granular mixture
A. Neramoen, D. K. Dysthe, E. Jettestuen, C. Raufaste
- [8] Mar. 2009, Geilo School, Geilo, Norway
Coupling between chemical alteration and mechanics: an experimental approach
C. Raufaste
- [7] Mar. 2009, Interpore conference, Kaiserslautern, Germany 2009
Sodium sulphate crystallization experiment in sintered glass
M. Angeli, C. Raufaste, D. K. Dysthe
- [6] Oct. 2008, 43ème Colloque du Groupe Français de Rhéologie, Palaiseau, France
Rhéologie et imagerie des écoulements 2D de mousse : de la bulle au milieu continu
C. Raufaste, I. Cheddadi, P. Marmottant, P. Saramito and F. Graner
- [5] July 2008, Eufoam 2008, Noordwijk, The Netherlands
Numerical modelling of foam Couette flows
I. Cheddadi, P. Saramito, C. Raufaste, P. Marmottant and F. Graner
- [4] Oct. 2007, Visco-plastic fluids: from theory to application, Monte Verità, Tessin, Switzerland
Couette flow of a foam: numerical simulation and experiments
I. Cheddadi, P. Saramito, F. Graner, P. Marmottant and C. Raufaste
- [3] Aug. 2007, 18th french congress of mechanics, Grenoble, France
Ecoulement 2D de mousse : une description locale
C. Raufaste, P. Marmottant, F. Graner
- [2] Aug. 2007, 18th french congress of mechanics, Grenoble, France
Interface dynamique entre liquides miscibles
P. Philippe, C. Raufaste, P. Kurowski, P. Petitjeans
- [1] July 2006, Eufoam 2006, Potsdam, Germany
The complex behaviour of 2D foam flow: a local description
C. Raufaste, P. Marmottant, F. Graner

TEACHING, LECTURES

Responsibilities

Responsible for teaching modules

since 2018: Fluid mechanics (Master 1 OAM), 6 ECTS credits, management of a team of 3 teachers and of approx. 10 students

2015-2018: Applied thermodynamics (Master 1 Pro EME), 3 ECTS credits, approx. 20 students

2014-2018: Mathematics (Master 1 Pro EME), 3 ECTS credits, approx. 20 students

Responsible for lab sessions

2015-2020: Foam physics (M2 P3M), design and implementation of 2 experiments, management of a team of 2 teachers, approx. 10 students

2014-2019: Waves (L2), design and implementation of 3 experiments, management of a team of 3 teachers, approx. 50 students

Administrative responsibilities

since 2018: member of the steering committee of the Master OAM ("Ondes, Atomes et Matière", Université Côte d'Azur): creation of the Master; choice of the program, teaching modules and pedagogical teams; student and teacher management. <http://master-oam.unice.fr/>

Master's degree

Fluid mechanics (M1 OAM, since 2018)

Lectures (12 hours per year)

Exercises (16 hours per year)

approx. 10 students per year.

- * Responsible for the teaching module (6 ECTS credits)
- * Management of a team of 3 teachers and of approx. 10 students.
- * Design of the module from scratch
- * Courses on the basics of fluid mechanics, viscous flows, potential flows and surface waves.
- * Design/correction of evaluations

Foam physics (M2 P3M, 2015-2020)

Lectures (3 hours per year)

Lab sessions (12 hours per year)

approx. 10 students

- * Responsible for the teaching module (3 ECTS credits) and for the lab sessions.
- * Management of a team of 2 teachers and of approx. 10 students.
- * Design of the module from scratch
- * Introduction to the physics of liquid foams (composition, Plateau's laws, mechanical properties)

- * Design and implementation of 2 experiments: Stokes experiment in a liquid foam (equivalent to the classical Stokes experiment of an object sedimenting in a Newtonian fluid, but here the fluid is non Newtonian) and bubble growth in a supersaturated liquid leading to foam formation.
- * Writing of a lab manual.
- * Supervision of students and correction of lab reports.

Statistical physics (M1 P3M, 2018/2019)

Lectures (15 hours per year)
 Exercises (12 hours per year)
 Lab sessions (20 hours per year)
 approx. 10 students.

- * Responsible for the teaching module (6 ECTS credits).
- * Management of a team of 2 teachers and of approx. 10 students.
- * Design of the lecture from scratch.
- * Design/correction of evaluations.

Applied thermodynamics (M1 Pro EME, 2015-2018)

Lectures (7.5 hours per year)
 Exercises (7.5 hours per year)
 approx. 20 students

- * Responsible for the teaching module
- * Design of the lecture from scratch
- * Design/correction of evaluations

Mathematics (M1 Pro EME, 2012-2018)

Lectures (9 hours per year)
 Exercises (9 hours per year)
 approx. 20 students

- * Responsible for the teaching module
- * Module designed for students having difficulties in mathematics to bring them to the required level of this Master's degree.
- * Writing of a lecture document
- * Mixed approach: classical lecture and project-based sessions. I divided the students into groups of 3-4 students, each of them with a rather open subject (Gini coefficient of a company, Cobb-Douglas production function, ...). They had to find the proper mathematical tools to solve the problem and to defend their project.
- * Design/correction of evaluations

Soft matter (M1 P3M, 2009-2017)

Lectures (12 hours per year)
 Exercises (6 hours per year)
 Lab sessions (4 hours per year)
 approx. 8 students per year

- * Teaching module about fluid interfaces, surface tension and soft rheology
- * Design of the lecture from scratch
- * Design and supervision of 1 lab session (Stokes flow in microchannels studied by microscopy and by particle image velocimetry)
- * Design/correction of evaluations

Electricity (M1 EFTIS prepa CAPES/AGREG, 2010-2012)

Lectures/Exercices (18 hours per year), approx. 10 students per year

- * Responsible for the teaching module
- * Module designed from scratch
- * Design/correction of evaluations

Fluid mechanics (M2 EFTIS prepa CAPES/AGREG, 2009-2012)

Online lectures (40 hours per year), approx. 10 students per year

- * Responsible for the teaching module
- * Module designed from scratch
- * Writing of a lecture document
- * Online lectures ("Master à distance") on fluid mechanics to prepare the teaching certification
- * Design/correction of evaluations

Bachelor's degree

Lab project (L3, since 2013)

Equivalent to 15 teaching hours per year

- * Supervision of 2-3 students to perform research-like experiments in a research institute. The project lasts 1 month approximately.
- * Development of a new experiment every year.
- * Examples

De bien singuliers rebonds

<http://physique.unice.fr/sem6/2019-2020/PagesWeb/PT/Rebond.pdf>

La Physique du propulseur: une arme préhistorique

<http://physique.unice.fr/sem6/2017-2018/PagesWeb/PT/Propulseur/>

Catapulte intelligente

<http://physique.unice.fr/sem6/2016-2017/PagesWeb/PT/Catapulte/>

Gouttes de Leidenfrost paramagnétiques

<http://physique.unice.fr/sem6/2015-2016/PagesWeb/PT/Leidenfrost/>

Acoustique des mousses liquides

<http://physique.unice.fr/sem6/2013-2014/PagesWeb/PT/Mousses/>

Physics of waves (L2, 2014-2019)

Lab sessions (36 hours per year)

- * Responsible of the lab sessions. Management of a team of 3 teachers, approx. 50 students per year.
- * New module initially, everything was designed from scratch
- * Design and implementation of 3 experiments: wave propagation (ultrasonic transducers ; travel time, wavelength and amplitude attenuation measurements ; application to echography), wave diffraction (ultrasonic transducer, characterization of the emission cone, two waves interferences) and wave interferences (Melde's and Kundt's tube experiments).
- * Writing of a lab manual.

Continuum mechanics (L3, 2009-2020)

Lab sessions (36 hours per year), approx. 30 students per year

- * Supervision of students and correction of lab reports.

Physics for biologists (L1, 2012-2015)

Lectures/Exercises (24 hours per year), approx. 25 students per year

- * Teaching the basics of fluid mechanics and thermodynamics for students in biology.
- * Design/correction of evaluations

Experimental physics (L2, 2009-2011)

Lab sessions (27 hours per year), approx 25 students per year

- * Supervision of students and correction of lab reports.