



# FLUID-ROCK INTERACTIONS IN THE SOLAR SYSTEM

12<sup>TH</sup>-16<sup>TH</sup> NOVEMBER 2018

NANTES

## ORGANISER :

LABORATOIRE DE PLANÉTOLOGIE ET GÉODYNAMIQUE  
BUILDING 4  
FACULTÉ DES SCIENCES ET TECHNIQUES  
2 RUE DE LA HOUSSINIÈRE - BP 92208  
44322 NANTES CEDEX 3 (FRANCE)

**2<sup>ND</sup> GEOPLANET THEMATIC SCHOOL**  
LECTURES & PRACTICALS IN PLANETARY GEOSCIENCES (INTERIOR AND SURFACE)

[HTTPS://LPG-UMR6112.FR/TS-GEOPLANET](https://lpg-umr6112.fr/ts-geoplanet)





GROUP	TIME	SPEAKER(S)	TITLE	TYPE	PLACE	
ALL	8:30 - 9:15	Registration and welcome coffee				Building 4 - LPG - Ground Floor - Hall
	9:15 - 10:00	Olivier Bourgeois and Olivier Verhoeven (LPG) Antoine Mocquet and Nicolas Mangold (LPG) Christophe Berthon (University of Nantes)	Introduction of the Thematic School		Building 4 - LPG Ground floor - Amphithéâtre	
	10:00 - 12:15	Christophe Sotin (NASA's Jet Propulsion Laboratory)	Detection and exploration of water reservoirs in the Solar System	Lecture		
	12:15 - *	Lunch				
PLANETARY SURFACES - GROUPS A AND B	12:30 - 19:00	Benjamin Rondeau, Stéphane Pochat, Anne Gaudin, Véronique Carrère and Marion Massé (LPG)	Field excursion at a Brittany coastal cliff: reading weathering and sedimentation in the landscape	Field excursion	Pénestin - (meeting point in the Hall of LPG)	
PLANETARY INTERIORS - EXPERIMENTS GROUPS 1, 2 AND 3	13:30 - 14:30	Yann Morizet (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure Introduction to experimental practicals	Practicals	Building 4 - LPG 1st floor - Meeting room n°121	
PLANETARY INTERIORS - EXPERIMENTS GROUP 1	14:30 - 17:30	Yann Morizet and Philippe Navaro (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure High pressure experiment		Building 4 - LPG Ground floor - room n°09 and Hall GEM	
PLANETARY INTERIORS - EXPERIMENTS GROUP 2	14:30 - 17:30	Erwann Le Menn (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure Raman analyses HR		Building 4 - LPG Ground floor - room n°017 (Raman)	
PLANETARY INTERIORS - NUMERICAL MODELLING	14:30 - 17:30	Gabriel Tobie, Gaël Choblet and Marine Lasbleis (LPG)	Modelling of internal dynamics		Building 4 - LPG 1st floor - Meeting room n°150	

**TUESDAY 13TH NOVEMBER 2018**

GROUP	TIME	SPEAKER(S)	TITLE	TYPE	PLACE	
ALL	9:00-10:30	Doris Breuer - DLR	Role of water and other volatiles on planetary geodynamical evolution	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre	
	10:30-10:45	Coffee-Break			Building 4 - LPG - Ground Floor - Hall	
	10:45-12:15	Edouard Ravier (LPG - Géosciences Le Mans)	Consequences of fluid overpressure on deformation and fracturing of sediments: terrestrial and planetary examples	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre	
	12:15 - 13:30	Lunch				
	13:30 - 14:30	Poster owners (cf. specific program)	Poster Session 1/3		Building 4 - LPG - Ground Floor - Hall	
PLANETARY SURFACES - GROUP A	14:30-17:30	Anne Gaudin and Véronique Ansan (LPG)	Petrological and mineralogical studies of two weathering profiles developed from a micaschist and an amphibolite	Practicals	Building 14 - room 38	
PLANETARY SURFACES - GROUP B		Edouard Ravier, David Peigné (LPG - Géosciences Le Mans) and Olivier Bourgeois (LPG)	Parameters controlling hydrofracturing processes: an experimental modelling approach		Building 2 - Ground Floor - room n°1&2 TP Chimie organique	
PLANETARY INTERIORS - EXPERIMENTS GROUP 2		Yann Morizet (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure High pressure experiment		Building 4 - LPG Ground floor - room n°09 and Hall GEM	
PLANETARY INTERIORS - EXPERIMENTS GROUP 3		Erwann Le Menn (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure Raman analyses HR		Building 4 - LPG Ground floor - room n°017 (Raman)	
PLANETARY INTERIORS - NUMERICAL MODELLING		Gabriel Tobie, Gaël Choblet and Marine Lasbleis (LPG)	Modelling of internal dynamics		Building 4 - LPG 1st floor - Meeting room n°150	
ALL	20:30	Olivier Grasset (LPG)	JUICE - Exploration du système de Jupiter	Public Lecture	Museum d'Histoire Naturelle de Nantes 12 Rue Voltaire, 44000 Nantes	

**WEDNESDAY 14TH NOVEMBER 2018**

GROUP	TIME	SPEAKER(S)	TITLE	TYPE	PLACE
ALL	9:00-11:00	François Guyot (IMPIC, Muséum National d'Histoire Naturelle)	Fluid-rock interactions in planetology: from the Earth's crust to exoplanet's deep interiors	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre
	11:00-11:15	Coffee-Break			Building 4 - LPG - Ground Floor - Hall
	11:15-12:15	Yann Morizet (LPG)	Fluid-rock interactions : an experimental perspective	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre
	12:15 - 13:30	Lunch			
	13:30 - 14:30	Poster owners (cf. specific program)	Poster Session 2/3		Building 4 - LPG - Ground Floor - Hall
PLANETARY SURFACES - GROUP A	14:30-17:30	Edouard Ravier, David Peigné (LPG - Géosciences Le Mans) and Olivier Bourgeois (LPG)	Parameters controlling hydrofracturing processes: an experimental modelling approach	Practicals	Building 2 - Ground Floor - room n°1&2 TP Chimie organique
PLANETARY SURFACES - GROUP B		Véronique Carrère, Marion Massé and Manuel Giraud (LPG)	Mineral identification and mapping using laboratory/field and imaging spectroscopy		Building 4 - LPG Ground floor - room n°023 (spectro)
PLANETARY INTERIORS - EXPERIMENTS GROUP 1		Erwann Le Menn (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure Raman analyses HR		Building 4 - LPG Ground floor - room n°017 (Raman)
PLANETARY INTERIORS - EXPERIMENTS GROUP 3		Yann Morizet and Philippe Navaro (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure High pressure experiment		Building 4 - LPG Ground floor - room n°09 and Hall GEM
PLANETARY INTERIORS - NUMERICAL MODELLING		Gabriel Tobie, Gaël Choblet and Marine Lasbleis (LPG)	Modelling of internal dynamics		Building 4 - LPG 1st floor - Meeting room n°150

**THURSDAY 15TH NOVEMBER 2018**

GROUP	TIME	SPEAKER(S)	TITLE	TYPE	PLACE
ALL	9:00-10:30	Susan Conway (LPG)	Morphological expression of fluid-rock interactions on planetary bodies	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre
	10:30-10:45	Coffee-Break			Building 4 - LPG - Ground Floor - Hall
	10:45-12:15	Susanne Schwenzer (Open University)	Earth and planetary hydrothermal systems	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre
	12:15 - 13:30	Lunch			
	13:30 - 14:30	Poster owners (cf. specific program)	Poster Session 3/3		Building 4 - LPG - Ground Floor - Hall
PLANETARY SURFACES - GROUP A	14:30-17:30	Véronique Carrère, Marion Massé and Manuel Giraud (LPG)	Mineral identification and mapping using laboratory/field and imaging spectroscopy	Practicals	Building 4 - LPG Ground floor - room n°023 (spectro)
PLANETARY SURFACES - GROUP B		Anne Gaudin and Véronique Ansan (LPG)	Petrological and mineralogical studies of two weathering profiles developed from a micaschist and an amphibolite		Building 14 - room 38
PLANETARY INTERIORS - EXPERIMENTS GROUPS 1, 2 AND 3		Yann Morizet (LPG)	Solubility of volatiles (C-H-O-S) in the popping rock: Experimental approach at high temperature and high pressure Conclusion		Building 4 - LPG 1st floor - Meeting room n°121
PLANETARY INTERIORS - NUMERICAL MODELLING		Gabriel Tobie, Gaël Choblet and Marine Lasbleis (LPG)	Modelling of internal dynamics		Building 4 - LPG 1st floor - Meeting room n°150

**FRIDAY 16TH NOVEMBER 2018**

ALL

GROUP	TIME	SPEAKER(S)	TITLE	TYPE	PLACE	
	9:00-10:30	Gabriel Tobie and Gaël Choblet (LPG)	Water-rock interactions in icy moons: New insights after Cassini-Huygens	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre	
10:30-10:45					Coffee-Break	Building 4 - LPG - Ground Floor - Hall
	10:45-12:15	Laetitia Le Deit (LPG)	Alteration at the surface of Mars	Lecture	Building 4 - LPG Ground Floor - Amphithéâtre	
	12:30-17:30	/	Visit of a vineyard and a wine cellar, followed by a wine tasting	Social event	Château de Chasseloir - (meeting point in the Hall of LPG)	

Virtual Reality Demonstrations will be offered during the week by Stéphane Le Mouélic, Marion Massé, Stéphanie Beaunay and Gwenaël Caravaca (LPG) in rooms n°167, 168 and 169 of building 4 (LPG).

POSTER BOARD NUMBER	TITLE	PRESENTER	INSTITUTION
1	Systematic study on the occurrence of melting in icy satellites: application to Europa and Titan	Kenny VILELLA	Academia Sinica, Institute of Earth Sciences
2	Heat generation and thermal evolution in the vicinity of Europa's strike slip faults	Katerina SLADKOVA	Charles University, Department of Geophysics
3	Dynamics of high-pressure ice layers of Ganymede and Titan	Klara KALOUSOVA	Charles University, Department of Geophysics
4	A simple equation governing Ultralow-Velocity Zones	Irene BONATI	ELSI/Tokyo Tech
5	Modelling the interior of some icy satellites	Yeva GEVORGYAN	IMCCE (Paris) / USP (São Paulo)
6	The depth of subsurface liquid water on Mars as predicted from 3D thermal evolution models	Ana-Catalina PLESA	German Aerospace Center (DLR)
7	The Martian Dynamo Powered by Fe Snow	Tina RÜCKRIEMEN-BEZ	German Aerospace Center (DLR)
8	Dissolution rates and reaction products of olivine in ammonia-rich fluids	Amber ZANDANEL	Université Grenoble Alpes
9	Scaling of heat transfer in stagnant lid convection for the outer shell of icy moons: Influence of rheology	Ludivine HAREL	Laboratoire de Planétologie et Géodynamique
10	Mimas, Enceladus, Tethys, Dione: contrasting geological paths for Saturn's inner icy moons	Mathilde KERVAZO	Laboratoire de Planétologie et Géodynamique
11	Cryomagma ascent from sub-surface reservoirs on Europa	Elodie LESAGE	Laboratoire GEOPS - Université Paris-Sud
12	Layer formation and evolution in Europa's subsurface ocean by double-diffusive convection	Teresa WONG	University of Münster

POSTER BOARD NUMBER	TITLE	PRESENTER	INSTITUTION
1	Iodine solubility in nuclear waste glass at high pressure	Valentin JOLIVET	Laboratoire de Planétologie et Géodynamique
2	The Relative Influence of H <sub>2</sub> O and CO <sub>2</sub> on the Primitive Surface Conditions and Evolution of Rocky Planets	Arnaud SALVADOR	Université Paris-Sud
3	A numerical modelling perspective of the Precambrian Rae-Hearne Craton and its implications to uranium mineralisation	Jonathan POH	Université de Rennes 1
4	Deep magnetic field stretching in numerical dynamos	Diego PEÑA	Observatório do Brasil
5	Time-varying magnetic fields of Mercury	Ingo WARDINSKY	Laboratoire de Planétologie et Géodynamique
6	Inspecting the Geochemical Kinetics of Europa from its Thermal Evolution	Elizabeth SPIERS	Georgia Institute of Technology
7	Morphological and spectroscopic analysis of light-toned materials in southeastern Gorgonum Chaos, Mars	David HAACK	German Aerospace Center (DLR)
8	Investigation of hydrated silica on Mars using CRISM data and terrestrial analogs	Maxime PINEAU	Laboratoire de Planétologie et Géodynamique
9	Bedforms formed on consolidated substrates by diffusion in fluid flows: inter-planetary comparison	Maï BORDIEC	Laboratoire de Planétologie et Géodynamique
10	High resolution topographic analysis and numerical simulations of landslides on Mars	Anthony GUIMPIER	Laboratoire de Planétologie et Géodynamique
11	Water-rock reactions on Mars - as seen through Earth analogues	Robert SEIDEL	Open University
12	Ganymede surface composition from near-IR spectral modeling of SINFONI/VLT observations	Nicolas LIGIER	Open University



POSTER BOARD NUMBER	TITLE	PRESENTER	INSTITUTION
1	Hale Crater on Mars - Gullies morphology and distribution	Axel NOBLET	Université de Nantes
2	Morphological study and geological interpretation of atypical craters on Meridiani Planum, Mars	Audrey BOULAIN	Université de Nantes
3	Temperature Dependent Sandstone Deformation	Mark JEFFERD	University College London
4	The formation mechanism of long runout landslides on planetary bodies	Giulia MAGNARINI	University College London
5	Visualisation of multi-resolution orbital and rover datasets in Gale Crater for geology	Divya M PERSAUD	University College London
6	Analog studies on Iceland for support of the MEDA instrument of the future Mars 2020 NASA mission	Antonio MOLINA	Centro de Astrobiología (CSIC-INTA)
7	Equatorial Surface Features as Observed by The Colour and Stereo Surface Imaging System (CaSSIS)	Adomas VALANTINAS	University of Bern
8	Martian active polar processes observed with the CaSSIS instrument	Camila CESAR	University of Bern
9	Distribution and Analysis of Calcium-Sulfate Cemented Sandstones Along the MSL Traverse, Gale Crater, Mars	Matthew NELLESEN	University of New Mexico
10	Insights from Trace Elements into Weathering Trends at Gale Crater, Mars	Ryan JACKSON	University of New Mexico
11	Experimental Constraints on Anoxic Water-Rock Interaction: Implications for the Early Martian Surface	Lucy KISSICK	University of Oxford
12	Identification of hydrated minerals in an unnamed crater in Thaumasia highlands of Mars	Pragya SINGH	Indian Institute of Technology Bombay