

International conference

MARID VII

Marine and River Dune Dynamics

3-5 April 2023 • Rennes, France

Conference booklet



Université
de Rennes



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Welcome

Welcome to MARID VII, the seventh edition of the Marine and River Dune Dynamics conference series.

In 2000, a workshop on marine sand wave dynamics was organised by the French Naval hydrographic and Oceanographic Office (Shom) and the University of Lille 1 (France) under the aegis of the North Sea hydrographic Commission. After the success of this first workshop, conferences covering marine and river dune dynamics were organised in 2004 (University of Twente, Enschede, the Netherlands), in 2008 (University of Leeds, United Kingdom), in 2013 (Royal Belgian Institute of Natural Sciences, Bruges Belgium), in 2016 (Caernarfon, University of Bangor, North Wales, UK) and in 2019 (Bremen, University of Bremen, Germany). Now known by the acronym MARID, these conferences provide state-of-the-art overviews and discussions on fundamental and applied knowledge of marine and river bedforms.

Bedforms are ubiquitous and dynamic features on a movable bed, which have been observed in many subaqueous environments, such as rivers, beaches, estuaries, tidal inlets, shallow seas, and deep waters. They are active morphodynamic elements which both reflect and influence hydrodynamic and sediment dynamics processes at various spatiotemporal scales. The study of their presence, size and movement is directly relevant for a wide range of applied and fundamental research. The processes governing bedform formation, dynamics and preservation have still not been unravelled adequately and the MARID VII delegates will outline progress derived from field observations, modelling studies and laboratory experiments across a wide number of disciplines, including earth sciences, oceanography, engineering, hydrography and biology.

MARID VII is held in Rennes, France, organised by the Institute of Physics of Rennes and Geosciences Rennes Laboratory (University of Rennes 1) and the French Naval hydrographic and Oceanographic Office (Shom). In keeping with the previous MARID conferences, we maintain the concept of a small, focused event with only plenary sessions to stimulate discussion among disciplines and methodology. Scientific sessions are taking place in Amphitheater TA Beaulieu (Pôle Numérique Rennes Bretagne) on 3 and 4 April 2023 including talks from keynote speakers and oral and poster presentations by delegates. On 5 April the field trip to the Mont-Saint-Michel Bay will permit convivial exchange between participants on the sediment dynamics.

We hope that MARID VII will lead to fruitful and productive discussions, which in turn should help and guide future collaborations to further investigate marine and river bedforms. The short format of the MARID conferences has proven to be ideally suited for such networking activities.

We wish you an enjoyable conference!

Alexandre Valance, Thierry Garlan, Alain Crave & Aurélien Gangloff

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Prof Dr Dan Parsons, University of Hull, United Kingdom

Prof Dr Vera Van Lancker, Royal Belgian Institute of Natural Sciences, Belgium

Dr Marc Roche, Federal Public Service Economy, Self-employed, SME's and Energy, Belgium

Dr Katrien Van Landeghem, Bangor University, United Kingdom

Dr Jaco Baas, Bangor University, United Kingdom

Prof Dr Christian Winter, Kiel University, Germany

Dr Alice Lefebvre, MARUM, University of Bremen, Germany

Prof Marco Colombini, University of Genoa, Italy

Conference program

Keynotes: 35 min + 10 min for questions

Long presentations: 15 min + 5 min for questions

Short presentations: 7 min + 3 min for questions

SUNDAY APRIL 2 EVENING (<i>Café des Champs Libres, Rennes downtown</i>)	
6.30 pm - 8.30 pm	Icebreaker and registration

MONDAY APRIL 3 MORNING (<i>PNRB Hall, Campus Beaulieu, Université Rennes</i>)	
8.15 am – 8.45 am	Coffee and registration
8.45 am – 9.00 am	Opening Session

SESSION I: Field Measurements			
9.00 am – 9.45 am	Van Lancker Vera	Tracking the human influence on the modern sedimentary system of the North Sea	Key-note
9.45 am – 10.05 am	Becker Marius	Dune orientation controlled by estuarine circulation in the Outer Weser estuary, German Bight, North Sea	Long
10.05 am – 10.25 am	Van Dijk Thaiënne	Dune preservation in the River Waal, Netherlands: sediment storage and microplastics distribution over time	Long
10.25 am – 10.35 am	Scheiber Leon	The influence of geometric definitions on dune characteristics	Short
10.35 am – 11.00 am		COFFEE BREAK	
11.00 am – 11.20 am	Robert Alexandre	How it works: benthic ecosystem functioning of submarine sand dunes, from traits-based diversity to isotopic diversity	Long
11.20 am – 11.30 am	Krämer Knut	Bedform transition related to sediment supply and transport capacity in the SW Baltic	Short

11.30 am – 11.40 am	Casalbore Daniele	Crescent-shaped bedforms on submarine volcanic flanks : the case of Salina	Short
11.40 am – 11.50 am	Cassol Willian	The influence of underwater dunes in the spatio-temporal presentation analysis of the hydrodynamic of the Saint-Lawrence River	Short
11.50 am – 12.10 am	POSTER FLASH PRESENTATIONS		
12.30 am – 1.30 pm	LUNCH		

MONDAY APRIL 3 AFTERNOON (PNRB Hall, Campus Beaulieu, Université Rennes)			
SESSION I: Field Measurements			
1.50 pm – 2.10 pm	Louge Michel	Aeolian transport thresholds, shear velocity and roughness evolution on a barchan dune - how dune skewness causes an anomaly at the brink	Long
2.10 pm – 2.20 pm	Plancke Yves	The residual sand and mud transport in the Schelde-estuarium, based on the calculation of the sediment balance	Short
2.20 pm – 2.30 pm	Roche Marc	Multi beam echosounder backscatter strength signature of dune files in the belgian part of the north sea	Short
2.30 pm – 2.40 pm	Damveld Johan	Episodical sand wave migration: analysis of high temppresentation resolution bathymetry	Short
2.40 pm – 3.00 pm	Daguinos Paul	Morphodynamics of submarines dunes superimposed on sand banks in a shallow macro-tidal environment, the example of the Haut Fond de Ouessant	Long
POSTER SESSION I			
3.00 pm – 4.30 pm	POSTERS + COFFEE BREAK		

4.30 pm – 4.50 pm	Zomer Judith	[recorded presentation] Interaction between two scales of fluvial bedforms and its impact on sediment transport dynamics	[rec] Long
4.50 pm – 5.00 pm	De Lange Sjoukje	Spatial variability in dune morphology is driven by local flow patterns	Short
5.00 pm – 5.10 pm	Winter Christian	Sedimentology of a relict bedform field in the Fehmarn Belt, Baltic Sea	Short
SESSION II: Renewable Marine Energy			
5.10 pm – 5.30 pm	Unsworth Chris	Offshore renewable infrastructure in a field of dunes – changes to near bed turbulence and suspended sediment.	Long
5.30 pm – 5.40 pm	Van Landeghem Katrien	What are the ecological implications of bedforms and accelerated seabed mobility around offshore windfarms?	Short
5.40 pm – 5.50 pm	Morvan Antoine	Potential thermal impact of wind farms within a dynamic seabed	Short

TUESDAY APRIL 4 MORNING (PNRB Hall, Campus Beaulieu, Université Rennes)			
SESSION III: Theoretical Modelling			
8.30 am – 9.15 am	Andreotti Bruno	A unified model of bedforms across the turbulent roughening transition	Key-note
9.15 am – 9.35 am	Narteau Clément	Coexistence of two dune growth mechanisms	Short
9.35 am – 9.55 am	Claudin Philippe	Hydrodynamical regimes in turbulent flows over a wavy surface and dissolution instability	Short
9.55 am – 10.05 am	Kearney William	The Naval Seafloor Evolution Architecture: a platform for predicting dynamic seafloor roughness	Long
10.05 am – 10.30 am		COFFEE BREAK	

10.30 am – 10.50 am	Lefebvre Alice	What is a dune? Towards a homogenization of the nomenclature of bedforms	Long
10.50 am – 11.10 am	Reesink Arjan	What is the representative elementary volume of preserved dune deposits?	Long
SESSION IV: Numerical Modelling			
11.10 am – 11.30 am	Overes Pauline	Exploring the main drivers of sand wave dynamics	Long
11.30 am – 11.40 am	Van Der Sande Wessel	Nonlinear modeling of estuarine sand dunes	Short
11.40 am – 11.50 am	Chauchat Julien	A numerical study on ripple evolution and migration using a two phase flow model	Short
11.50 am – 12.00 am	Nnafie Abdel	Modelling effects of shoreface-connected sand ridges on the shoreline evolution: Application to the Belgium coast	Short
12.30 am – 1.30 pm	LUNCH		

TUESDAY APRIL 4 AFTERNOON (PNRB Hall, Campus Beaulieu, Université Rennes)			
SESSION IV: Numerical Modelling			
1.50 pm – 2.10 pm	Gilletta Alban	Hydrodynamic simulations of flow around a pile using turbulence-resolving models	Long
2.10 pm – 2.20 pm	Mathieu Antoine	Simulation of bedform formation using an Eulerian two-phase flow model	Short
2.20 pm – 2.30 pm	Lokin Lieke	The influence of sediment transport formulas on modelling river dune development	Short
2.30 pm – 2.40 pm	Durand Noemie	Modelling the evolution of marine dunes in a shallow shelf sea	Short

2.40 pm - 3.00 pm	Roos Pieter	On Elevation and Migration: a Model for Sandbank Dynamics in Sediment-scarce Seas	Long
POSTER SESSION II			
3.00 pm – 4.00 pm		POSTER + COFFEE BREAK	
SESSION V: Laboratory Experiments			
4.00 pm – 4.45 pm	Vriend Nathalie	Bedform dynamics: interaction, attraction and repulsion of dunes	Key-note
4.45 pm – 5.05 pm	Vah Mélanie	Bedload quantification by passive acoustic measurement: case of an isolated dune	Long
5.05 pm – 5.25 pm	Wu Xuxu	Clay winnowing associated with wave-current ripple dynamics on cohesive sand-clay beds	Long
5.25 pm – 5.35 pm	Frank-Gilchrist Donya	Vortex Trapping of Sand Grains over Ripples Under Oscillatory Flow	Short
5.35 pm – 6.00 pm		CLOSING SESSION	
8.00 pm – 10.00 pm		GALA DINNER in Rennes Downtown <i>Restaurant « La Closerie » 34 Pl. des Lices, 35000 Rennes</i>	

WEDNESDAY APRIL 5 (PNRB Hall, Campus Beaulieu, Université Rennes)	
8.00 am - 5.30 pm	Field Excursion Departure: PNRB Hall, Campus Beaulieu, Université Rennes Return: Rennes Railway Station

POSTER LIST		
01	Abroug Iskander	Influence of short-period irregular waves on the morphology and dynamics of subaqueous dunes generated under unidirectional flows
02	Bennis Anne-Claire	MORPHODUNES: a new project dedicated to the morphodynamics of sand dunes to build a new numerical tool
03	Bobiles Kevin	Characterisation of flow dynamics over estuarine
04	Daguinos Paul	Morphological and architectural variability of marine sand banks on a macro tidal dispersive shelf
05	Daynac Jimmy	Deep Learning: A new tool for mapping and analysis fields of dunes (ex : Rub'Al Khali sand sea)
06	De Lange Sjoukje	Influence of silt in sand-silt mixtures on dynamic near-equilibrium bedform geometry
07	Le Bot Sophie	Marine dune morphodynamics and associated sedimentary fluxes: Spatio-temporal variability and relations with hydrodynamic forcings
08	Lefebvre Alice	The influence of dune lee side shape on flow above bedforms
09	Michelet Nicolas	Estimation of marine dunes migration through sediment flux calculation and three-dimensional numerical modelling
10	Narteau Clement	Direct validation of dune instability theory
11	Nexer Maëlle	How to study marine dunes in an offshore windfarm context
12	Portos- Amill Laura	MELODY: Understanding the scale interactions between tidal sand waves and the lower shoreface
13	Romagnoli Claudia	Bedforms and morpho-bathymetric evolution of tributary channels in the Po river delta (Italy)
14	Scheiber Leon	Dune scaling in the Tien River, Vietnamese Mekong Delta
15	Valance Alexandre	Morphodynamics of two-dimensional isolated subaqueous dunes

Field excursion to the Mont-Saint-Michel Bay

Wednesday April 5

8.00 am: Meeting point at Campus Beaulieu (PRNB hall, Campus Beaulieu, 263 Av. Général Leclerc, 35042 Rennes)

8.10 am-9.30 am: Bus travel to Mont Saint-Michel

9.30 am-12 am: Exploring bedforms in the context of the Bay with sedimentologists (B. Tessier and F.Guillocheau)

12.00 am-1.00 pm: Picnic (lunch box will be provided)

1.00 pm-1.30 pm: moving to Mont saint-Michel

1.30 pm – 3.30 pm: free visit of the Mont saint-Michel

3.45 pm- 5.15 pm: Return travel to Rennes

5.30 pm: Final stop at Rennes Railway station

Recommendation: bring extra shoes for walking in the mud (boots, old sport shoe, ...) and warm clothes for field trip in humid and windy context.

Documentation: Field trip guide and maps can be downloaded from:

<https://www.geologicalfieldtripsandmaps.com/296/issue-64/the-bay-of-mont-saint-michel-sedimentary-facies-morphodynamics-and-holocene-evolution-of-a-hypertidal-coastal-system.html>



List of Delegates

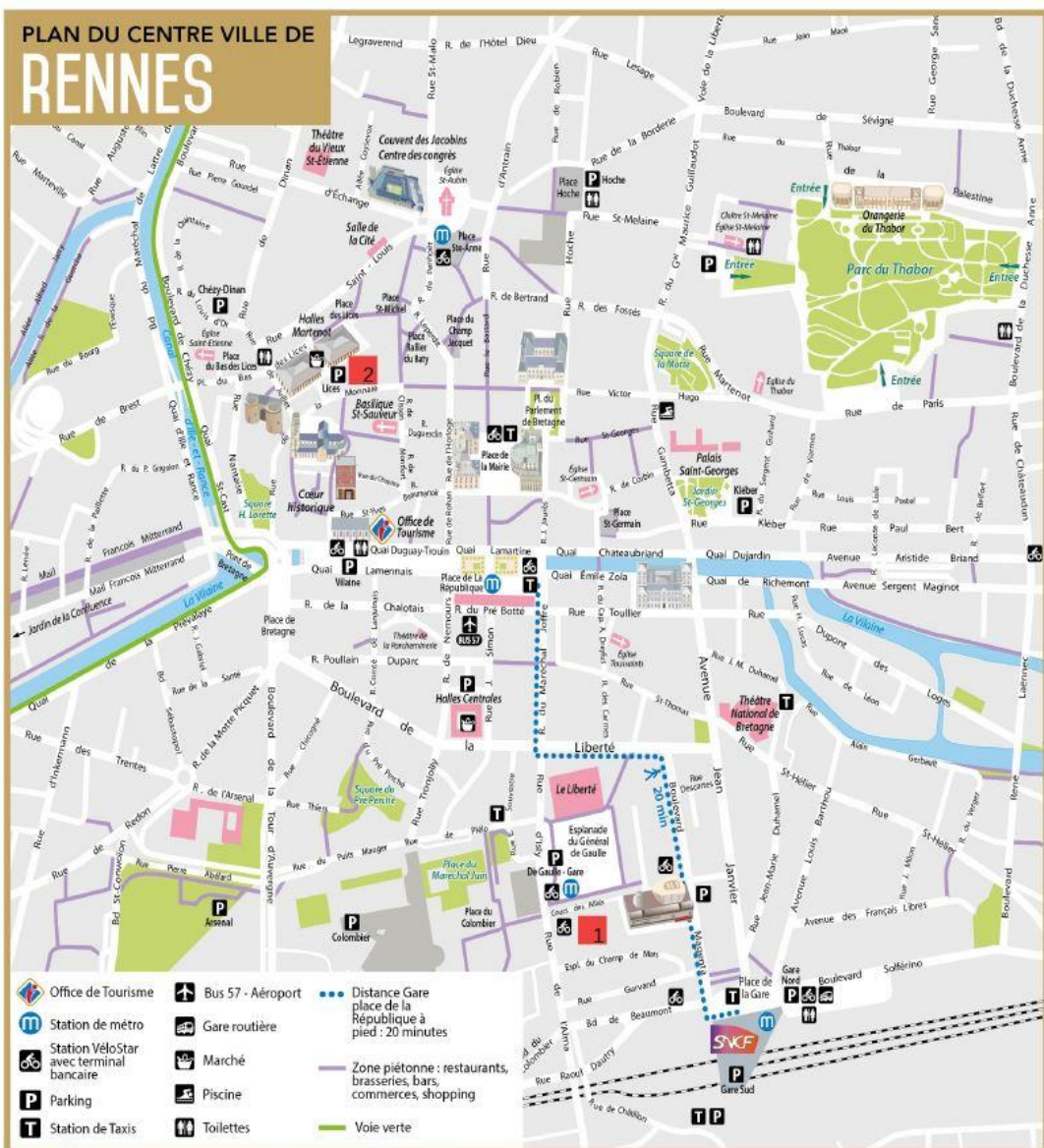
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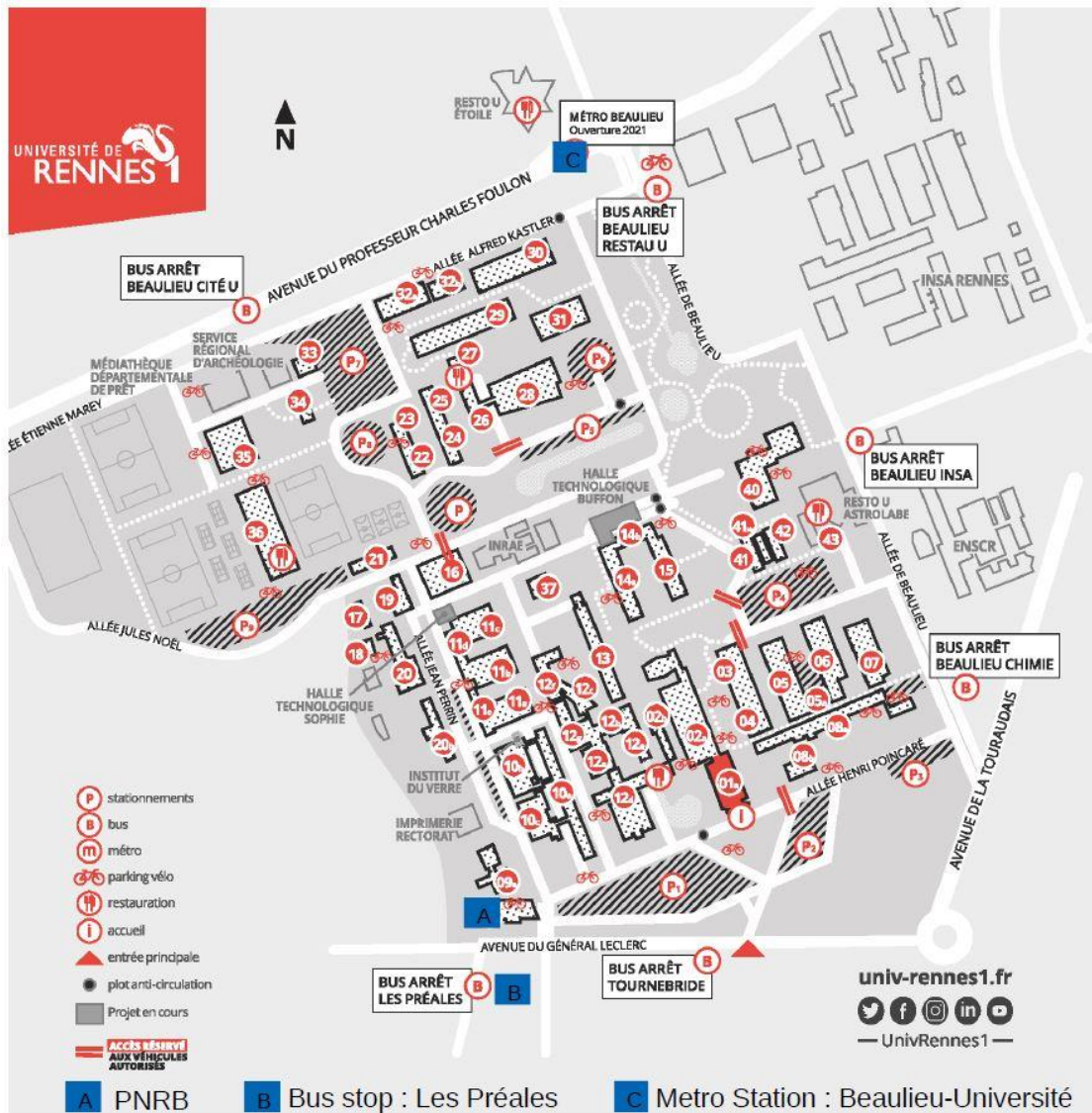
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MAP OF RENNES DOWNTOWN

PLAN DU CENTRE VILLE DE RENNES



CAMPUS BEAULIEU



Organising institutions



Support



Simplified Scientific Program

Monday April 3

08:15 – 08:45	<i>Coffee and registration</i>
08:45 – 09:00	Welcome by organisers
09:00 – 09:45	Keynote V. Van Lancker
09:45 – 10:35	Session 1: Field measurements
10:35 – 11:00	<i>Coffee Break</i>
11:00 – 11:50	Session 1: Field measurements
11:50 – 12:00	Poster flash presentation
12:00 – 13:50	<i>Lunch break and Poster session</i>
13:50 – 15:00	Session 1: Field measurements
15:00 – 16:30	Poster Session
16:30 – 17:10	Session 1: Field measurements
17:10 – 17:50	Session 2: Marine Renewable Energy

Tuesday April 4

08:30 – 09:15	Keynote B. Andreotti
09:15 – 10:05	Session 3: Theoretical Modelling
10:05 – 10:30	<i>Coffee Break</i>
10:30 – 11:10	Session 3: Theoretical Modelling
11:10 – 12:00	Session 4: Numerical Modelling
12:00 – 12:10	Poster flash presentation
12:10 – 13:50	<i>Lunch break and Poster session</i>
13:50 – 15:00	Session 4: Numerical Modelling
15:00 – 16:30	Poster Session
16:30 – 17:15	Keynote N. Vriend
13:50 – 15:00	Session 5: Laboratory Experiments