JIP PITCHES AND NEXT FER WEEK

ARMOR	Nicolas Tcherniguin
MI Issues	Pedro Barros
Steady Seas	Don Hoogendoorn
PREDICTO	Delphine Rigaud
GLAMOOR	Laure Cossalter

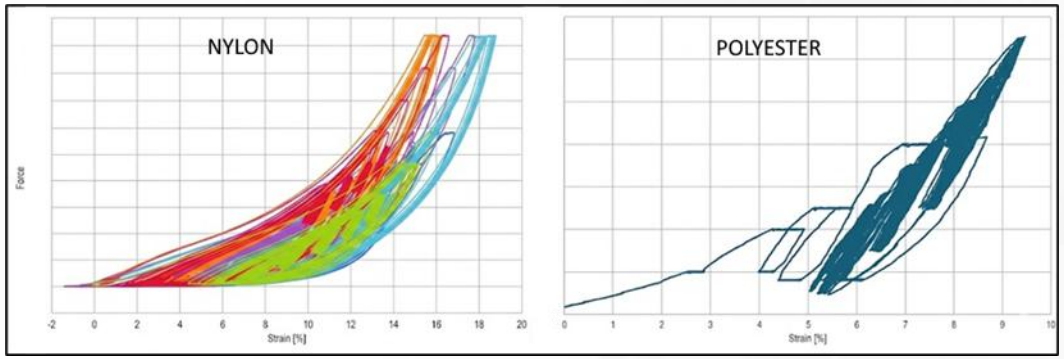
NEXT FER WEEK

ARMOR JIP

AI Based Realistic Modeling Of Synthetic Ropes

Motivation

The offshore industry has been using **synthetic ropes**, but presently the **mooring analysis method** overly simplifies complex **nonlinear behavior** of synthetic ropes, which does not properly consider non-linear stiffness behavior that varies with load magnitude, loading rate, loading history, hysteresis damping, *et cetera*.

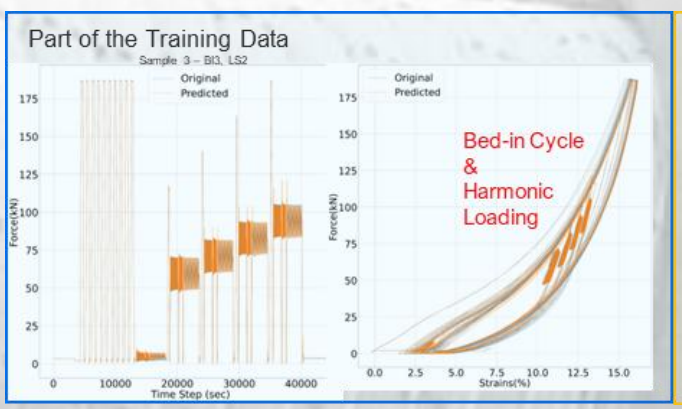


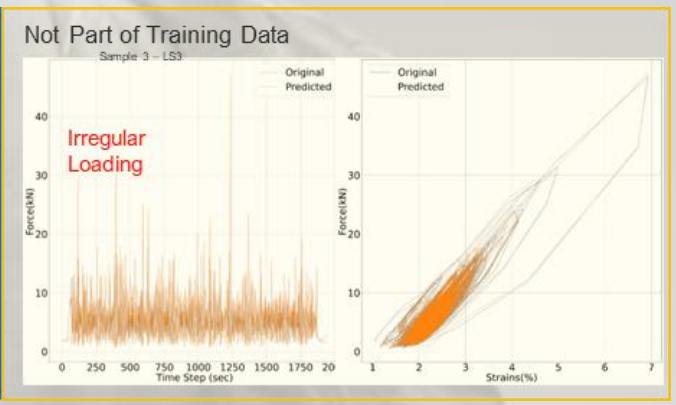
Approach

- Develop methodology for a more accurate and realistic representation of synthetic rope stress-strain behavior using comprehensive rope load test data and Artificial Intelligence (AI)
- Develop an interface between AI rope model and a mooring analysis program

TECHNIP ENERGIES

Preliminary Results





Benefits

- **Optimized mooring design with improved certainty**
- **Digital twin with AI rope model offers more accurate information for condition and predictive maintenance of mooring, platform, risers, etc.**
- **Improved crew safety and reduced risks during offshore and quayside marine operations, offloading operation using synthetic ropes**

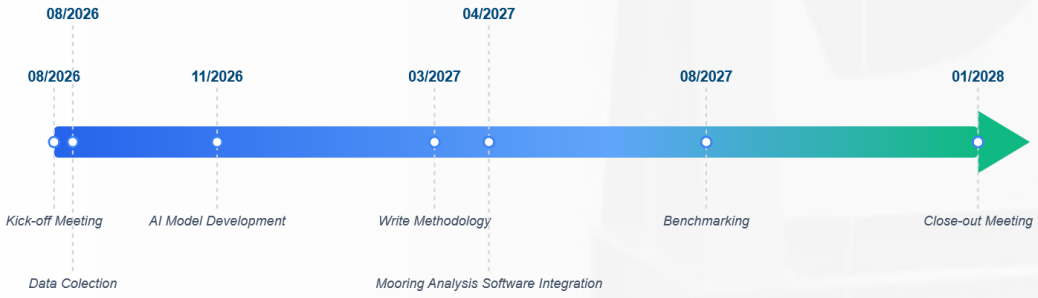
ARMOR JIP

AI Based Realistic Modeling Of Synthetic Ropes

Scope of Work

- Collect synthetic rope test data and make recommendations for required load test methodology to train an AI Model
- Develop an AI model to represent the full characteristics of nonlinear Stress-Strain relationship for each complete relevant synthetic rope test data set
- Verify the trained model with a wide range of regular and irregular loading test data
- Develop AI model's interface with mooring analysis program, OrcaFlex
- Compare mooring analysis results (strength and fatigue) between conventional model and AI model for selected floating offshore platform/s

Preliminary Timeline



T.EN TECHNIP ENERGIES

Deliverables

- **Overall Methodology including AI Model Development Framework and required load test methodology to train an AI Model**
- **Interface program for mooring analysis software, OrcaFlex**
- **Summary of comparison results for conventional model and AI model of synthetic ropes for selected floating offshore platform/s**

Participation and fees

- **Operators: $100k payable over 2 financial years**
- **Others: $60k payable over 2 financial years**
- **Regulators: in-kind contribution**
- **Synthetic Rope Manufacturers: in-kind contribution with load test data**

Open Meetings:

- **1st Meeting: 27th May 2026**
- **2nd Meeting: 3rd June 2026**

We are open to dedicated meetings as well.

Contact:

Anil Sablok, JIP Project Manager

***email*: anil.sablok@ten.com**

Update of Mooring Integrity Issues

Project proposal to **DeepStar®**

Pedro Barros, Aberdeen, 20 May 2026

Update of Mooring Integrity Issues

Proposal to be presented formally to the DeepStar® members according to the defined channels.

Project Champion: Equinor

DeepStars Core Member Companies in attendance and interested, can consider supporting via DeepStar, becoming co-champions.

Others are welcome to present their interest.

DeepStar® Update of Mooring Integrity Issues

1	2	3	4	5	6	7	8	9	Submitted
Initiation	Concept	Proof of Concept	Integration	Demonstration	Prototype	Pre-production	Production	Field Proven	mm/dd/yy

Application:	Update and Expand DeepStar's Mooring Integrity Database.	**DeepStar Director:**	Shak Shamshy, shakir@chevron.com
Focus Area Theme:	Floating systems & Metocean / Surface facilities	**DeepStar Project Manager:**	Curtis Linehan, curtis@theooc.org
Strategic Drivers:	Deepen insight into mooring system failure modes to drive continuous enhancements in reliability and safety performance	**Project Champions:**	Equinor, Øyestein Gabrielsen, oygab@equinor.com
Technology Development Stage:	7-9	**Proposed Contractors:**	DNV AS, Pedro Barros, pedro.barros@dnv.com

Business Case / Impact: *Value Drivers / Primary Benefit of this work*
Detailed understanding of failure mode occurrence rates strengthens decision-making processes for improvement of operational procedures, mooring system design, maintenance, system monitoring and it is essential for research effort guidance.
Accurate and comprehensive monitoring of mooring system operational performance is the basis for sustained reliability, cost and safety improvement.

Objectives:
(1) To update of *Deepstar® project 20401,* completed in 2021, Mooring Integrity Issues database with recent data and increased participant base.
(2) Review failure modes to be monitored e.g. corrosion and wear rates.
(3) and investigate the development a continuous anonymous update system.

Tasks to *be Addressed:*
Perform a workshop to address lessons learned, review the failure modes scope to be monitored and define guidelines to develop a continuous anonymized system for database updates. The contractor will collect, compile and publish the data in accordance with different levels of accessibility the level i.e. "contributing members" and general public. A final workshop will be organized to review the results of the data collected and address future work and participants interaction.

Deliverables:
1. Expanded and updated database of reported reliability data of mooring systems.
2. Project report summarizing observations, results and guidelines for development of continuous update system.
3. Two workshops facilitated by the contractor.
4. Framework for continuous update system.

Potential Interested Parties: (Name & Company)
Equinor,...

Insert a brief description of the picture

Schedule		
Start Date	**End Date**	**Budget**

DeepStar© 2026 Program — A Global Offshore Technology Development Consortium

Update of Mooring Integrity Issues

Background

- *Deepstar® project 20401,* Mooring Integrity Issues, was completed in 2021.
- Failure modes statistics database should be updated and source extended.

Business Case / Impact: *Value Drivers / Primary Benefit of this work*

- Detailed understanding of failure mode occurrence rates strengthens decision-making processes for improvement of operational procedures, mooring system design, maintenance, system monitoring and it is essential for research effort guidance.
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Opportunity within the FER Week:

Hold project meetings at FER Week.

Update of Mooring Integrity Issues

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www.dnv.com

OFFSHORE O&G IS FACING A STRUCTURAL POWER CRISIS

- 78% of Norwegian Continental Shelf subsea discoveries cannot meet sanctioning hurdle rates. SURF costs are the primary reason
- CCS projects are being developed >100 km offshore. Far beyond economic cable reach
- Production hubs are declining. Spare pipeline capacity exists, but marginal pools often can't justify the tieback investments

€6.9B Annual global SURF CAPEX	**€1.5M** Avg. cost per km of umbilical
€1.4M Downtime cost per day (20k bbl/d)	**78%** NCS tie-backs failing hurdle rates

THIS IS NOT A SOLARDUCK OPINION

This Is Your Industry Speaking

"Everybody wants to get rid of umbilicals."
VP, Global Industry Association

"One third of all O&M costs relate to controls and umbilical maintenance."
MD, Global Leader in Underwater Vehicle Charging

"O&G operators would love to remove umbilicals completely."
Manager, Global Leader in Subsea BESS Solutions

"A major operator chartered a vessel for 12 months at tens of millions of dollars simply as contingency in case the umbilical failed."
General Manager, Marine Contractor

"There have been a few of those umbilical issues with various operators."
Sales Manager, World Leader in Subsea Equipment

JIP – STEADY SEAS

Objective

Objective

Develop and qualify a standard Offshore Floating Power Hub (OFPH).

A Swiss-knife power solution that eliminates the long umbilical and unlocks stranded reserves currently beyond economic reach.

THE OFFSHORE FLOATING POWER HUB

Flexible As A Swiss Army Knife

What it is:

- A floating solar-hybrid platform (PV + BESS + backup generators)
- With ample space for additional client systems
- Designed as a Normally Unattended Installation (NUI)
- Connects via short umbilical to subsea assets

How it works in 4 steps:

- Platform is assembled quayside from modular kit components
- Towed to field by standard tug. No heavy-lift vessel required
- Operates unattended, visited only twice a year (target: once)

Baseline configuration:

- Platform: ~30 × 30 × 15 m, draught <6 m
- Peak power: up to 250 kWp
- Continuous power: 20 kW
- Battery storage: up to 2,000 kWh
- Backup generators: 2 × 20 kW
- Payload capacity: up to 80 tons
- Water depth: up to 1,300 m
- Certified to withstand 100-yr Hs 13.7 m waves

PROVEN — NOT A CONCEPT, A TRACK RECORD

Three pilots. Five years. Multiple geographies. Zero lost-time incidents.

Project	Year/ Location	Scale	Key validation
King Eider	2021, NL inshore	65 kW	Triangular platform concept, mooring, structural integrity. Approval in Principle (AiP) from Bureau Veritas, AON insured
Teal	2024, Tokyo, Japan	80 kW	International deployment, transport & assembly logistics in new geography. Survived cyclone wind conditions.
Merganser	2024, North Sea	500 kW	BV NI631 Prototype Certification, AON insured, SodM approved maintenance, Hs up to 11.6 m, zero accidents

Merganser: world's first Bureau Veritas-certified and AON-insured offshore floating PV system.
No other floating solar company has achieved this.

JIP – STEADY SEAS

Work Packages

WP 01
Project Management

✓ Overall technical coordination and planning

✓ Risk management and quality assurance

✓ Reporting, communication, and dissemination of project results

WP 02
Requirements Definition

✓ Gather operator requirements and operational use cases

✓ Define performance, HSE, certification, and interface specifications

✓ Assess business case, TCO, and CO_2-reduction potential

WP 03
Develop Basic Design

✓ Basic design of the Offshore Floating Power Hub

✓ Conduct third-party design verification

✓ Approval in Principle (AiP) / Statement of Feasibility of classification society

WP 04
Hydrodynamic Research

✓ Develop validated hydrodynamic model

✓ Tank test verification

JIP – STEADY SEAS

Designed To Be Low-risk And Value-generating At Every Step.

Duration

24 Months
Start 2026M06

Budget

3800 kEUR Total Budget
3200 kEUR Dutch government grant secured
600 kEUR SolarDuck in-kind contribution

Project Partners

SolarDuck (Lead)
Marin

WHAT WE ASK

No CAPEX commitment. No FID obligation. One decision: join the JIP:

Your contribution to the JIP

- Operator requirements and operational use cases
- Access to project site data

JIP partner benefits

- Feasibility study for 1 site (for each JIP partner)
- A verified standard OFPH design
- Half-yearly project updates
- Participation in the overall project (38x multiplier)

Who

- 3-4 Operators and Integrators

What it costs

- 100 kEUR contribution
- Inhouse support

What happens after the JIP

- Commercial project to unlock your stranded asset

CONTACT DETAILS

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CTO & Co-Founder

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info@solarduck.tech

JIP PREDICTO

PREDICTING CORROSION EVOLUTION IN OFFSHORE UNITS

PITCH – 20TH MAY 2026

WHY A NEW JIP?

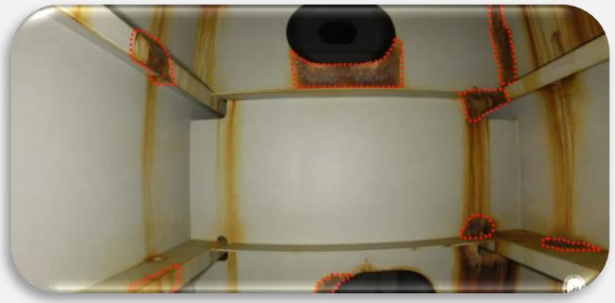
How to predict **evolution of observed corrosion** on offshore units and **adapt repair plan?**

AGS 3D: AI INSPECTION ECOSYSTEM

BV AUGMENTED SURVEYOR 3D

Digital 3D model

- Localised corrosion
- Access to pictures



Digital 3D Model

What's coming next ?

One digital 3D Model

- Automatic thickness measurements importation
- Corroded surface measurements
- Characterisation of corrosion type

And predictive tool for maintenance and repair

JIP CORROSION IN TANK

Institut de la Corrosion
French Corrosion Institute

BUREAU VERITAS

Objective: Develop tool to anticipate corrosion evolution in tanks and evaluate criticality

Ballast parameters

- pH, Temperature, refilling frequency, flow rate etc
- immersion/splash zone/atmospheric

Corrosion laws

- Literature review
- Test in laboratory + optional field instrumentation

Structural criticality Assessment

- Simplified strength and fatigue update with corrosion data
- Structural criticality map of corroded areas

AGS3D Integration

- Alert levels depending on level of corrosion and structural criticality

Structural criticity \ Corrosion	No corrosion	Mild corrosion	Severe corrosion
Low loading			
Moderately loaded			
Hot spot			

EXPECTED OUTCOME

For operators

Digital inspection campaigns data

Corrosion kinetic model adapted to tank operating modes

Criticality results for its studied asset

Tool

Expand AGS3D capabilities

Facilitate inspection and asset integrity management

Rules

Revisit alternative inspection scheme

Incorporate asset integrity management tool in inspection scheme (AGS notation)

TIMELINE AND BUDGET

Timeline

3 years

Start end of 2026 / beginning of 2027

Budget

Minimum Budget: 350 k€

In-kind participation possible

CONTACTS

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BUREAU VERITAS

GLAMOOR project JIP

- **Context** : Pursue R&D efforts on PA6 following POLYAMOOR/MONAMOOR/BAMOS JIP projects
- **Planning :** 10/2026 → 10/2030
- **Objectives** :

WP2: Ageing protocols & degradation modes

- Study of ageing mechanisms via accelerated protocol at yarn/subrope scale
  - Polymer network characterisation
  - Mechanical damage characterisation

WP3: Impact on fatigue

- Impact of ageing on fatigue via FIBULA model & validation:
  - Input : yarn on yarn testing & self heating measurements
  - Outputs : abrasion model investigation
- Investigation of damage cumulation for fatigue estimation via measurements

WP4: 1D model for engineering applications

- Impact of rope scale/geometry on POLYAMOOR law
- Design study : comparison of law, material in design >toward recommandations
- Damage cumulation for fatigue estimation via modeling

WP5: In situ experimentation

- MONABIOP buoy deployment over 3 years with PA6 ropes segments
- Strain/stress monitoring
- Full rope characterization : ageing & fatigue

- **R&D partners** : ENSTA, IFREMER, IFPEN, France Energies Marines
- **Industrial entrance Fees** : 17,5k€ to 35k€ / year for mid or large groups + possibility to participate technically with in-kind contribution

Thank you for your attention

- Please contact us for any related project : **France Energies Marines**

Laure.cossalter@france-energies-marines.org

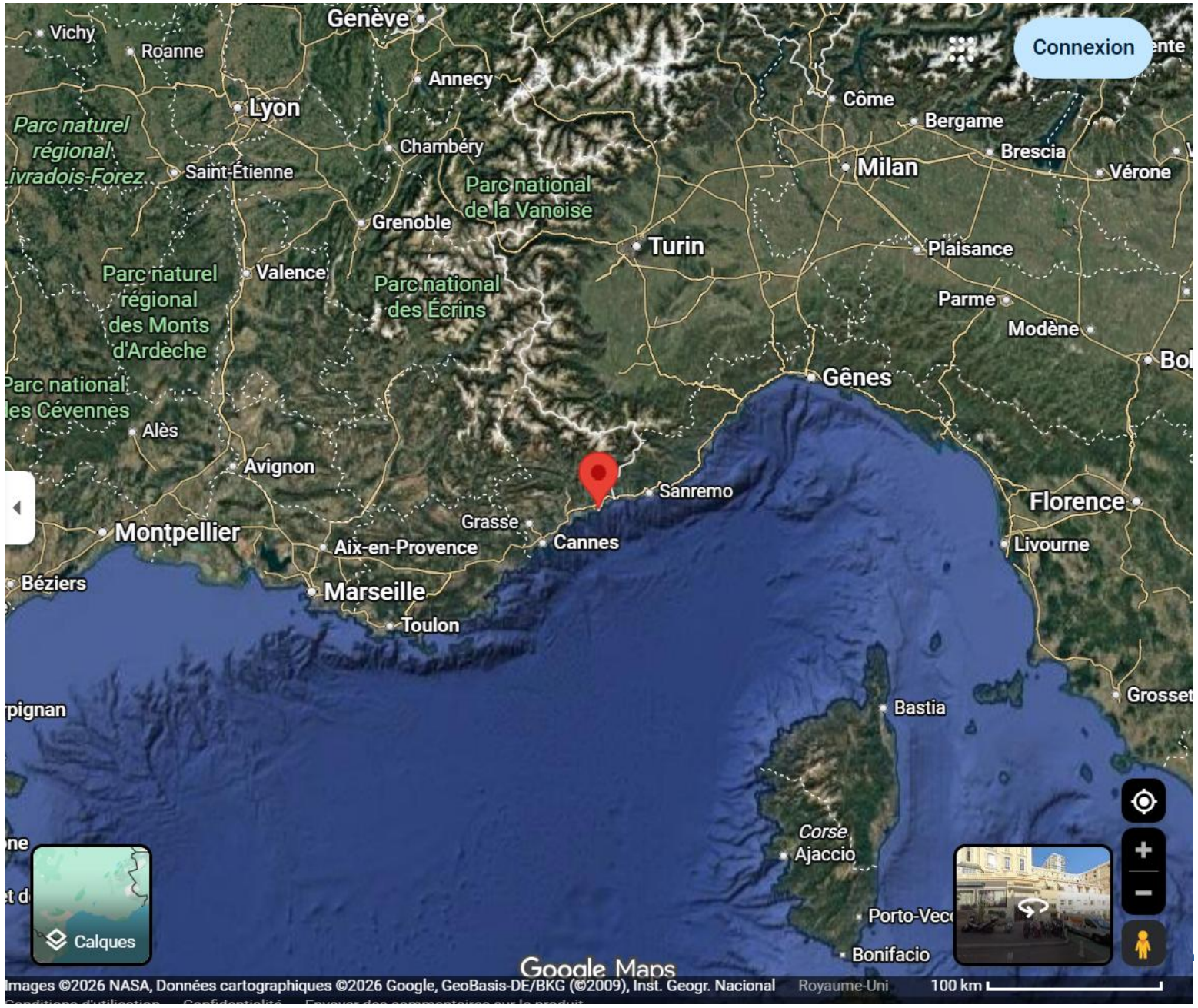
Nicolas.ruiz@france-energies-marines.org

JIP-FER Week - Fall 2026

FER Forum
Aberdeen, Scotland
20-May-26

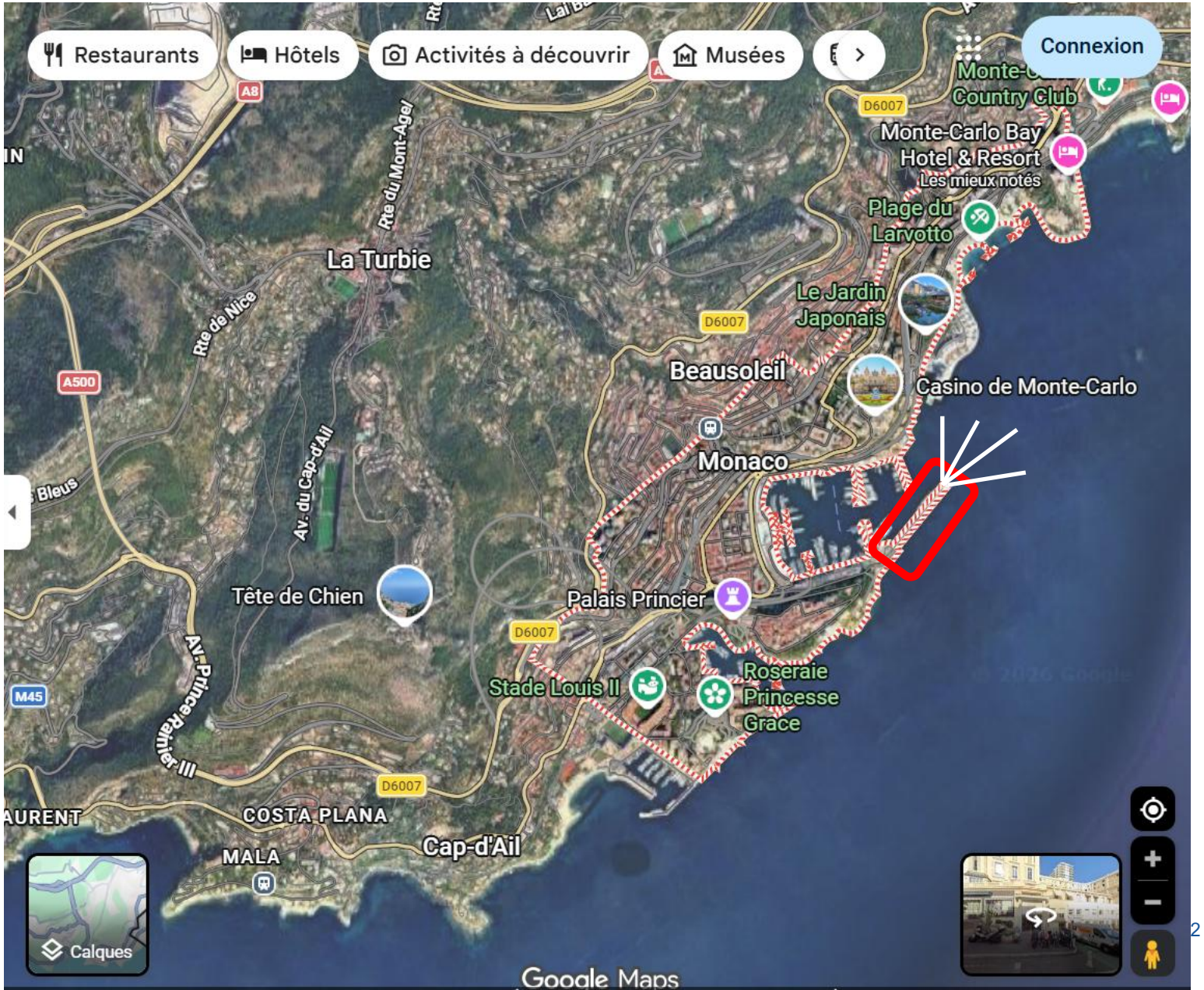
Host, Date & Location

- SBM Offshore
- October 19th -23rd, 2026
- Monaco



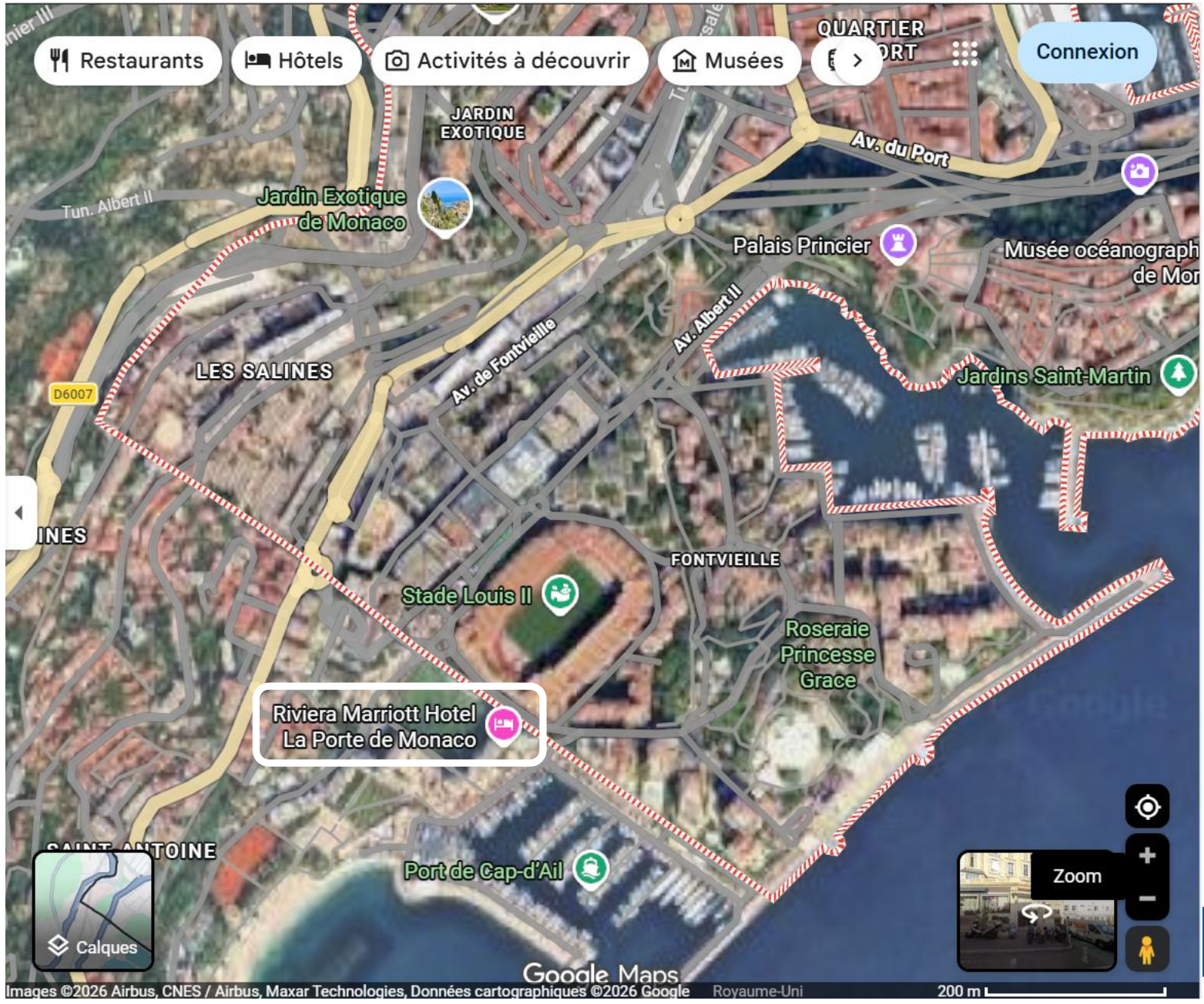
More on Host

- SBM hosted JIP week in
  - October 2003
  - March 2011
  - March 2014



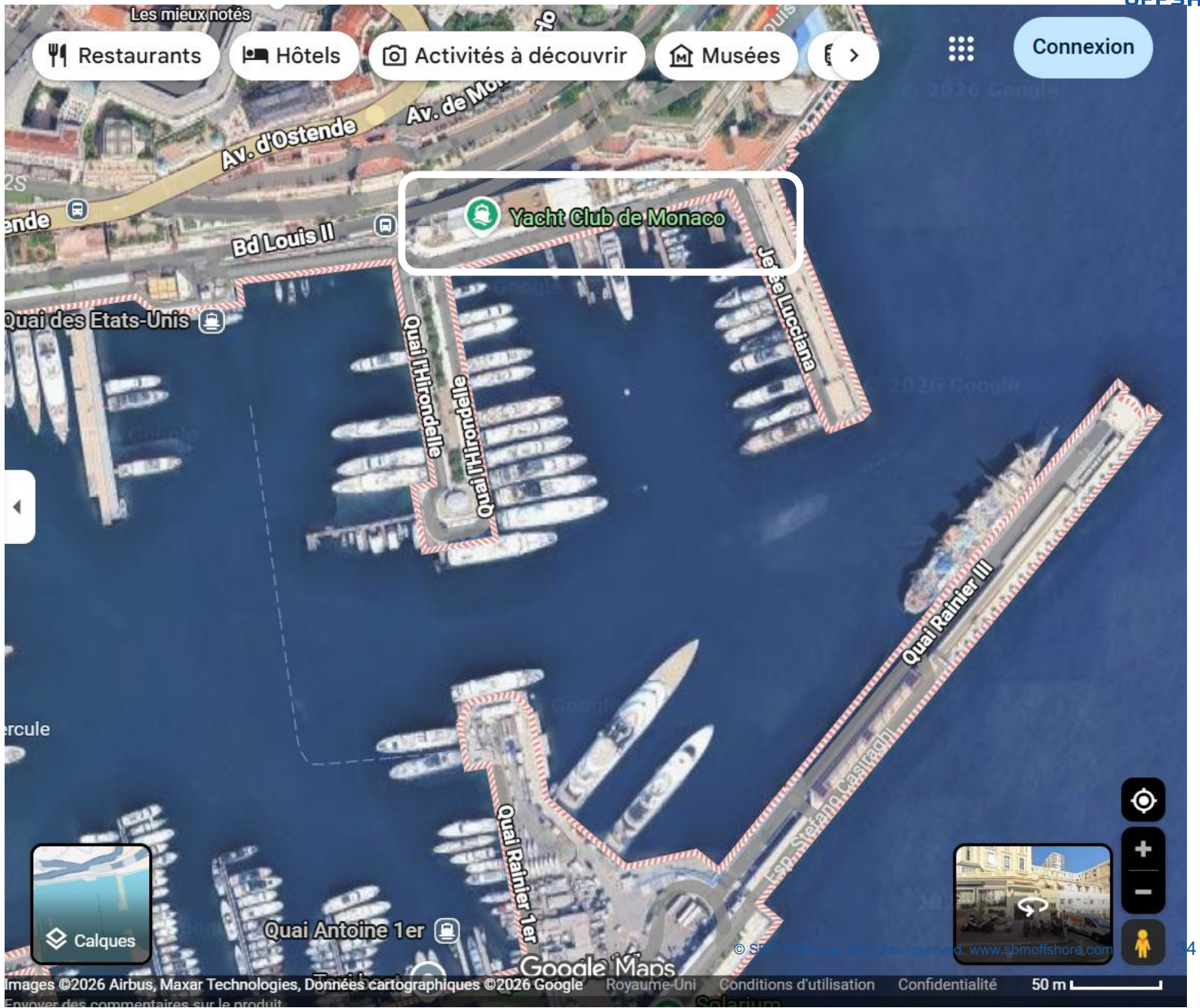
More on Location

- Two meeting locations:
  - Marriott Hotel (Cap d'Ail)
    - Days 1, 2 ,4 and 5



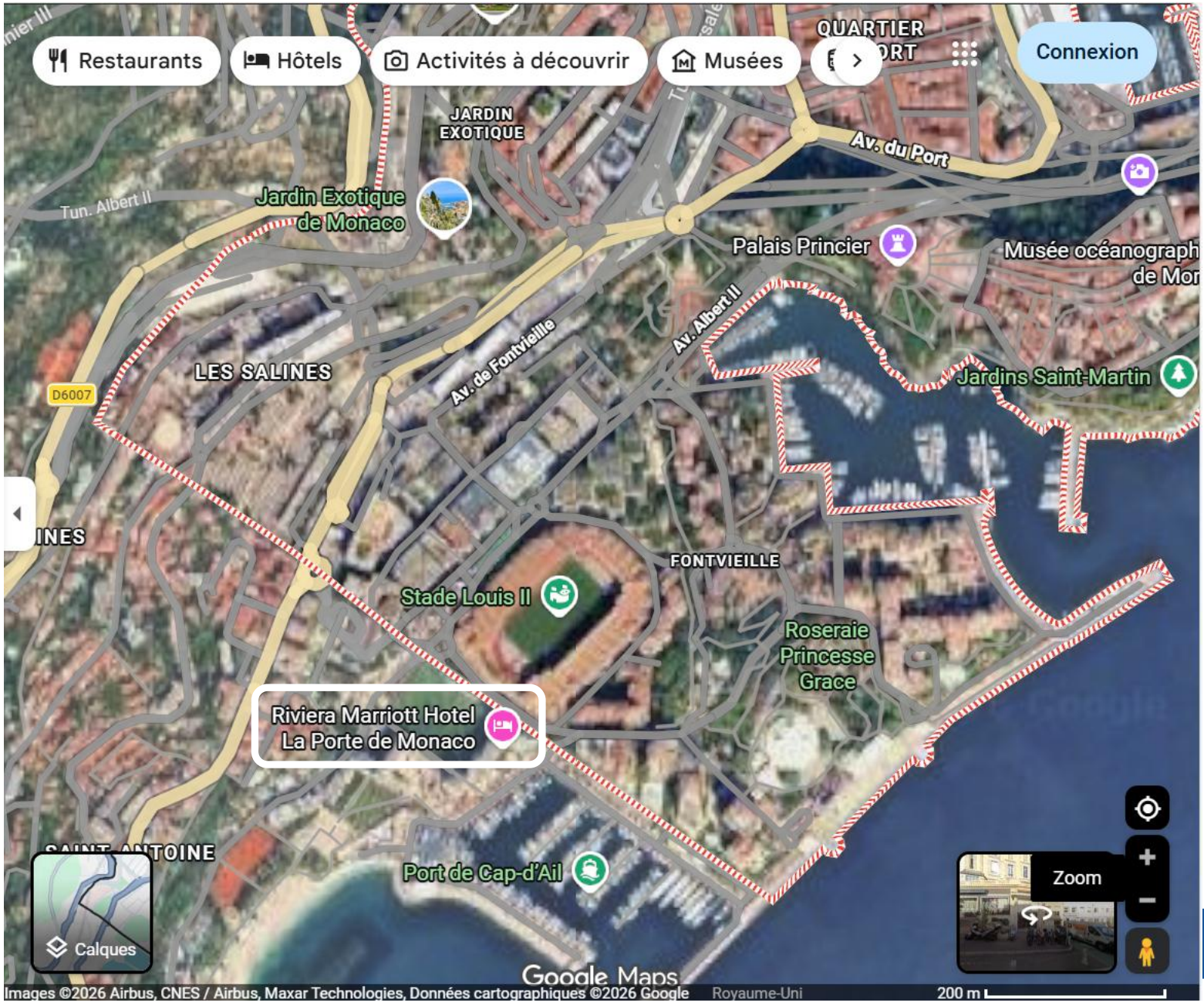
More on Location

- Two meeting locations:
  - Monaco Yacht Club (Ball Room)
    - Day 3



Accommodation

- Marriott Hotel (Cap d'Ail)
  - Negotiated fares



How to get there ?

- By air to Nice Cote d'Azur Airport (2nd largest in France)
  - From airport to Marriott hotel
    - Taxi
    - Regional train to Monaco-Monte Carlo train station (15min walk from train station to Marriott hotel)

- By High-Speed Train to Nice Ville train station
  - Regional train to Monaco-Monte Carlo train station (15min walk from train station to Marriott hotel)

Weather to expect

🌡️ Temperatures

- **Daytime:** typically **19–23°C**
- **Night:** around **13–16°C**
- Still comfortable for outdoor activities, but evenings can feel cool.

🌊 Sea Temperature

- Around **19–21°C**
- Still swimmable for many people, especially earlier in the week.

🌞 Sunshine

- About **6–8 hours of sunshine per day**
- Days are shorter than summer but still generally bright.

Weather to expect (cont)

Rainfall

- October is one of the **wetter months** on the Côte d'Azur
- Expect:
  - **4–7 days of rain in the week**
  - Rain can be **heavy but short-lived**, sometimes with thunderstorms

Wind

- Mostly light winds, but occasional stronger episodes (e.g., **easterly storms or mistral effects nearby**)

Fun things to do

- Monaco Oceanographic Museum

- Beach Volley-Ball (Plage Marquet - Cap d’Ail)

More seriously…

- What is the origin of the coined statistical term “Monte Carlo Simulations”

🧭 Detailed origin

1. Birth of the method (Los Alamos, ~1946–1947)

- The method was first developed during the **Manhattan Project** to solve complex problems like neutron transport in nuclear reactions. lanl
- Key contributors:
  - **Stanisław Ulam** (idea originator)
  - **John von Neumann**
  - **Nicholas Metropolis** lanl +1
- The idea came when Ulam considered using **repeated random trials** (inspired by playing solitaire) to estimate probabilities instead of solving equations analytically. umanitoba

More seriously…

- What is the origin of the coined statistical term “Monte Carlo Simulations”

2. Why “Monte Carlo”?

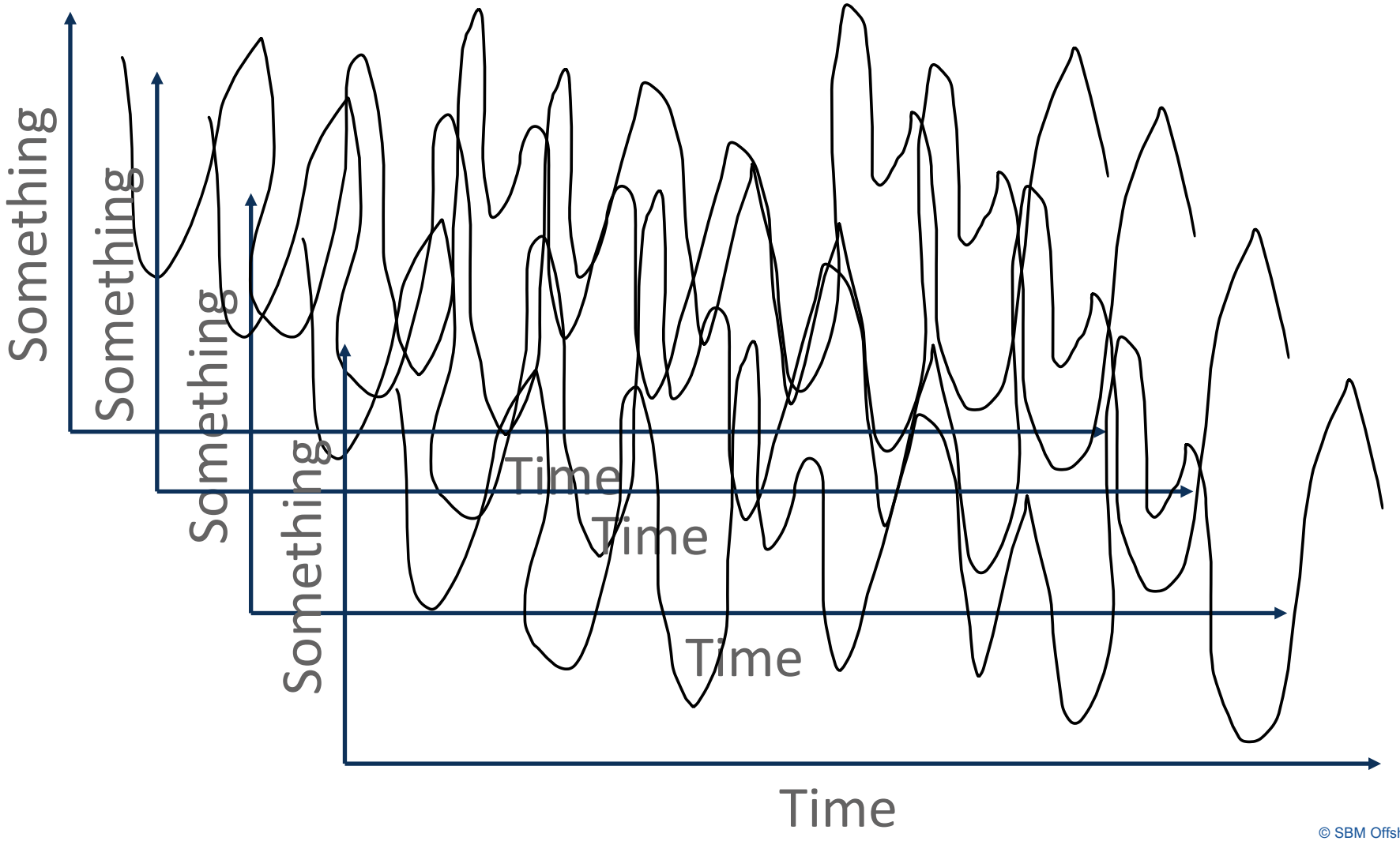
- The name was chosen because of the strong link between the method and **randomness / probability**, just like **casino games**. geeksforgeeks
- It specifically refers to the **Monte Carlo Casino in Monaco**, one of the most famous gambling venues in the world. wikipedia

Two closely related anecdotes explain the choice:

- Ulam had an **uncle who frequently gambled at Monte Carlo**, and this inspired the naming. wikipedia +1
- The term was reportedly introduced by **Nicholas Metropolis around 1947**. wikipedia +1

In short…

- Whether you are interested in these Monte Carlo Simulations



In short…

- Or these Monte Carlo Simulations


SBM
OFFSHORE