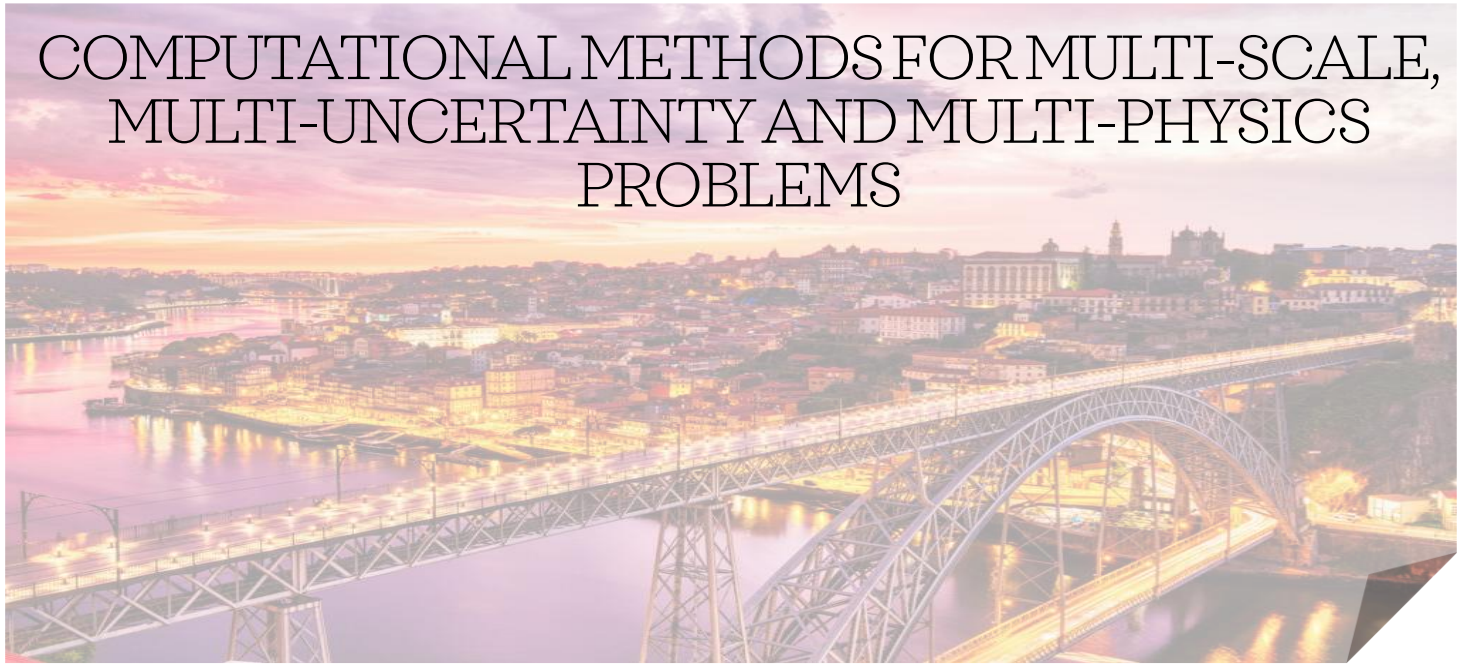
COMPUTATIONAL METHODS FOR MULTI-SCALE, MULTI-UNCERTAINTY AND MULTI-PHYSICS PROBLEMS



https://cm3p.org/

ABOUT CM3P


IACM
IACM SPECIAL INTEREST CONFERENCE

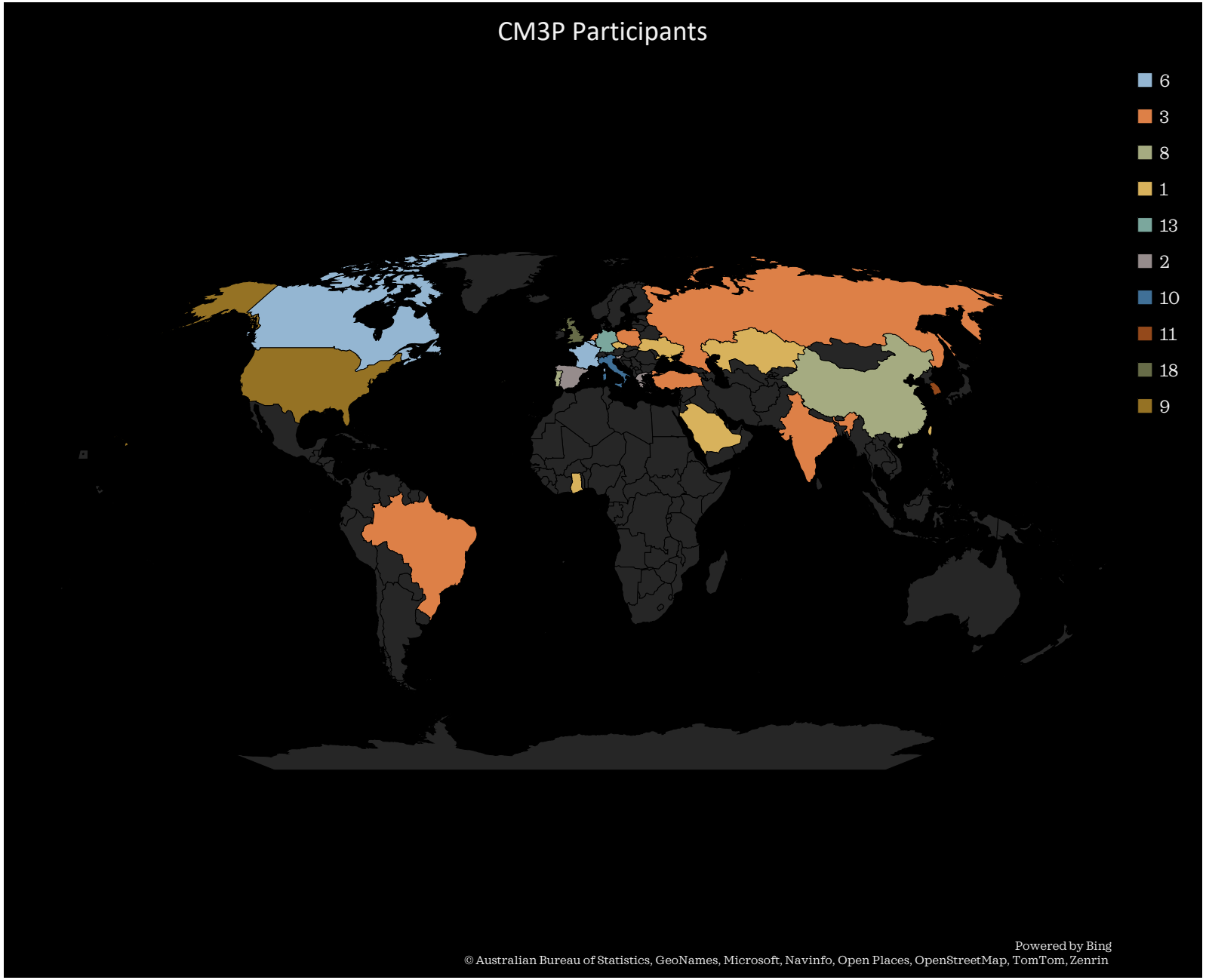

ECCOMAS
ECCOMAS Thematic Conference

Over the past two decades, there has been a notable surge in interest surrounding the advancement of multi-physics, multi-scale and multi-uncertainty models. This surge can be attributed to the emergence of new mathematical formulations and numerical solution strategies, coupled with the escalating computational power-to-cost ratio. These factors have collectively contributed to a remarkable expansion within this dynamically evolving field.

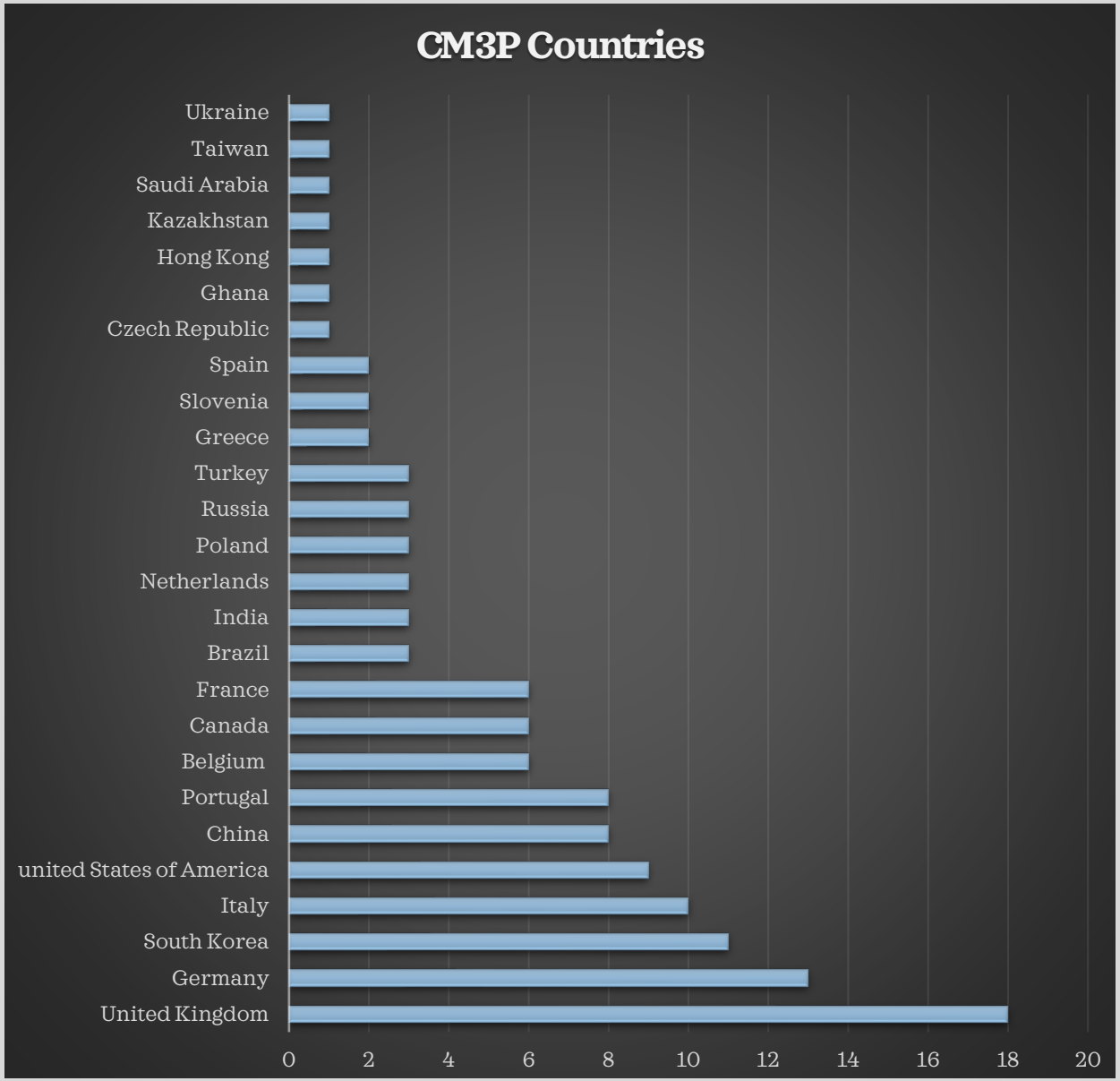
The research landscape in this domain has focused extensively on formulating and integrating various analytical tools, such as homogenization and asymptotic analysis, alongside leveraging advanced computational methods like parallel computing, stochastic analysis, and code coupling. The application of these tools and methods spans a wide array of fields, including but not limited to metal processing, composite materials, oil and gas development, fuel cell technology, and biomedical tissue engineering. This diversification underscores the versatility and applicability of the developed models.

Significantly, these advancements have played a pivotal role in deepening our comprehension of the intricate interactions inherent in multi-physics and multi-uncertainty phenomena occurring across diverse scales in both space and time. The synergy of novel mathematical frameworks, innovative numerical approaches, and the increased efficiency of computational resources has propelled this field into a central position, fostering breakthroughs and insights across a spectrum of scientific and engineering disciplines. In the most general format, the CM3P conference targets the latest advances in the M3 fields, including the following (not exhaustive) research topics:

- Computer simulation of multi-physics processes/systems
- Computational homogenization and multi-scale modelling
- Stochastic modelling, probabilistic engineering, reliability and risk assessment
- Computational coupling strategies
- High-performance computing related to the M3 (multi-physics, multi-scale and multi-uncertainty) challenges
- Relevant scientific and industrial applications
- Other related topics



Where are we from?


CM3P Countries
Ukraine
Taiwan
Saudi Arabia
Kazakhstan
Hong Kong
Ghana
Czech Republic
Spain
Slovenia
Greece
Turkey
Russia
Poland
Netherlands
India
Brazil
France
Canada
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Portugal
China
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Italy
South Korea
Germany
United Kingdom
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Plenary Sessions

Prof. Peter Wriggers

Professor of Continuum Mechanics and Computational Mechanics
Leibniz Universität Hannover, Germany

Third Medium Contact for Multi-field Applications

1st July

Prof. Eugenio Oñate Ibañez de Navarra

Professor of Structural Mechanics
Universitat Politècnica de Catalunya and CIMNE, Spain

Multiscale Computational Methods for Analysis of Particle-laden Flows and Their Effect on Structures

1st July

Prof. Thomas J.R. Hughes

NAE, FRS
John O. Hallquist Distinguished Chair in Computational Mechanics
Peter O'Donnell Jr. Chair in Computational and Applied Mathematics
The University of Texas at Austin, USA

The Two Roles of the Variational Multiscale Method

2nd July

Prof. Laura De Lorenzis

Professor of Computational Mechanics
ETH Zürich, Switzerland

Variational Phase-field Modeling of Fracture: towards Second-Generation Models

3rd July

Conference Programme

Day 1 { July 1st }

- Sessions starts at **09h00** followed by a coffee-break @ 10h00
- **10h20:** Plenary Session by **Peter Wriggers** @ Auditorium
- **12h30: Lunch break 14h00:** Plenary Session by **Eugenio Oñate Ibañez de Navarra** @ Auditorium
- **14h50:** Regular sessions
- **16h10:** Coffee-Break

Day 2 { July 2nd }

- Sessions starts at **09h00** followed by a coffee-break @ 10h20
- **10h40:** Plenary Session by **Thomas J.R. Hughes** @Auditorium
- **Lunch break** from 12h20
- **14h00:**Afternoon sessions
- **16h00:** Coffee-Break

Conference Program

Day 3 { July 3rd }

- Plenary session by Laura De Lorenzis starts at **09h30** @ Auditorium followed by coffee-break @ 10h20;
- **12h40: Lunch break** from 12h50
- **14h30:** Departure by Bus for Social Program

SOCIAL PROGRAM

Panoramic visit of Porto, which will give you a general idea of Porto, of its historical and modern quarters and its cultural and social aspects.

Visit to Real Companhia Velha Port Wine Cellars one of the oldest wine company in Portugal, having celebrated 265 years of existence and uninterrupted activity. Deep in the silence of our cellars, Ports rest in noble oak barrels, a product of the hand of skilled coopers that have working with the Company for many generations.

19h00 - After this visit and wine tasting we will go down the hill to Gaia quay for a **cruise with dinner served on board that will start at 19h00** giving you the opportunity to admire the sunset.

22h00 - At the end of the dinner, around 22h00, participants return to their Hotels by there own.

WELCOME TO PORTO

Fun fact: Porto's Livraria Lello is considered one of the most beautiful bookstores in the world and is rumored to have inspired J.K. Rowling's vision of Hogwarts.

Nestled along the Douro River in northern Portugal, **Porto is the second-largest city in Portugal**. With a population of around 230,000, it's a city large enough to offer exciting things to see and do, yet small enough to be easily explored on foot.

Porto boasts a historic city center, a **UNESCO World Heritage Site** famed for its stunning medieval architecture, and picturesque riverfront, boarded by the "rabelo" boats.

Visitors can explore the historic **Ribeira** district, marvel at the iconic **Dom Luís I Bridge**, and enjoy a leisurely stroll through the vibrant **Bolhão Market** or marvel the world-famous **ceramic tiles** around the city in S. Bento train station or Carmo church.

Porto is also famous for its namesake win, **Port wine**, produced in the nearby Douro Valley.

What to eat around Porto?

One of the region's iconic specialties is the **Francesinha**, a decadent sandwich filled with layers of meats, covered in melted cheese and a rich beer-based sauce. **Seafood** is also a highlight, with **grilled fish** such as sardines and **bacalhau** (salted cod) being local favorites. For dessert, the famous **Pastéis de Nata**, custard tarts with a crispy, caramelized exterior, offer a sweet end to any meal.

Where to have lunch during CM3P?

- Participants who selected and paid for the **lunch option during the registration period**, may have lunch in the Venue´s Restaurant.
- In check-in you were given a **voucher for lunch**, that you must show when entering the Restaurant.
- **Keep your voucher for lunch on July 2nd, 3rd and 4th.**

- The **Venue restaurant cannot acomodate more reservations for lunch** than the ones that have alreday been placed.
- We offer some **alternative suggestions** we might want to consider for lunch during MADEAI conference.

Where to lunch?

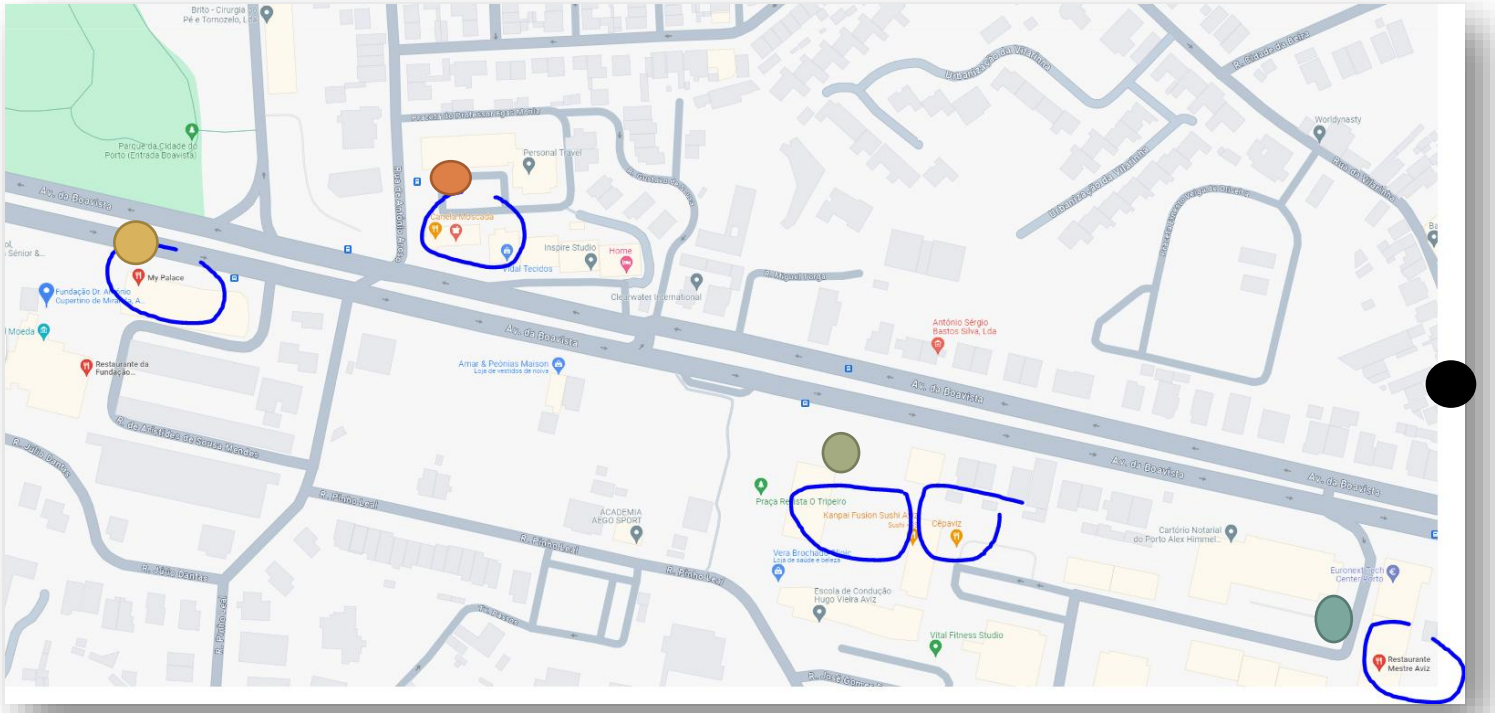
My Palace (1 min walking) (restaurant)

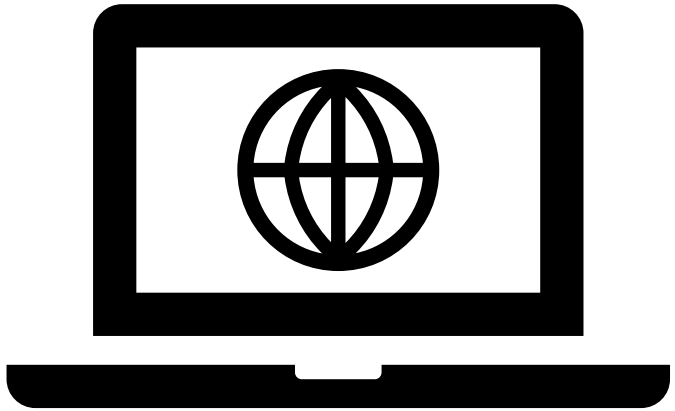
Canela Moscada (2 min walking); (light snacks)

Kanpai Fushion Sushi Aviz (10 min walking)

Restaurant Mestre Aviz (10 min walking)

Tourigalo (15 min walking)





C. Congressos

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How to connect to wifi.

THANK YOU

https://cm3p.org/

Conference Chairs

Prof. Chenfeng Li FLSW

Swansea University, United Kingdom

Prof. Francisco .M. Andrade Pires

University of Porto (FEUP), Portugal