

Contact Mechanics and Elements of Tribology

Foreword to the 11th edition

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@ Centre des Matériaux (& virtually)
February 24, 2026



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- Acquaintance
- Welcome survey
- Course content
- Complexity of contact physics
- Notations

Please introduce yourself

Nominally 213 participants from 32 different countries

Argentina Australia Austria Bangladesh Belgium Brazil Bulgaria Canada
Cameroon China Colombia Denmark Egypt France Germany Greece Hong Kong
India Iran Ireland Italy Morocco Netherlands New Zealand Pakistan
Romania Russia Senegal South Korea Spain Switzerland Syria Tunisia
Turkey United Arab Emirates United Kingdom USA Vietnam

Welcome questionnaire



<https://forms.gle/YA7eTnGoL26qvHFZ9>

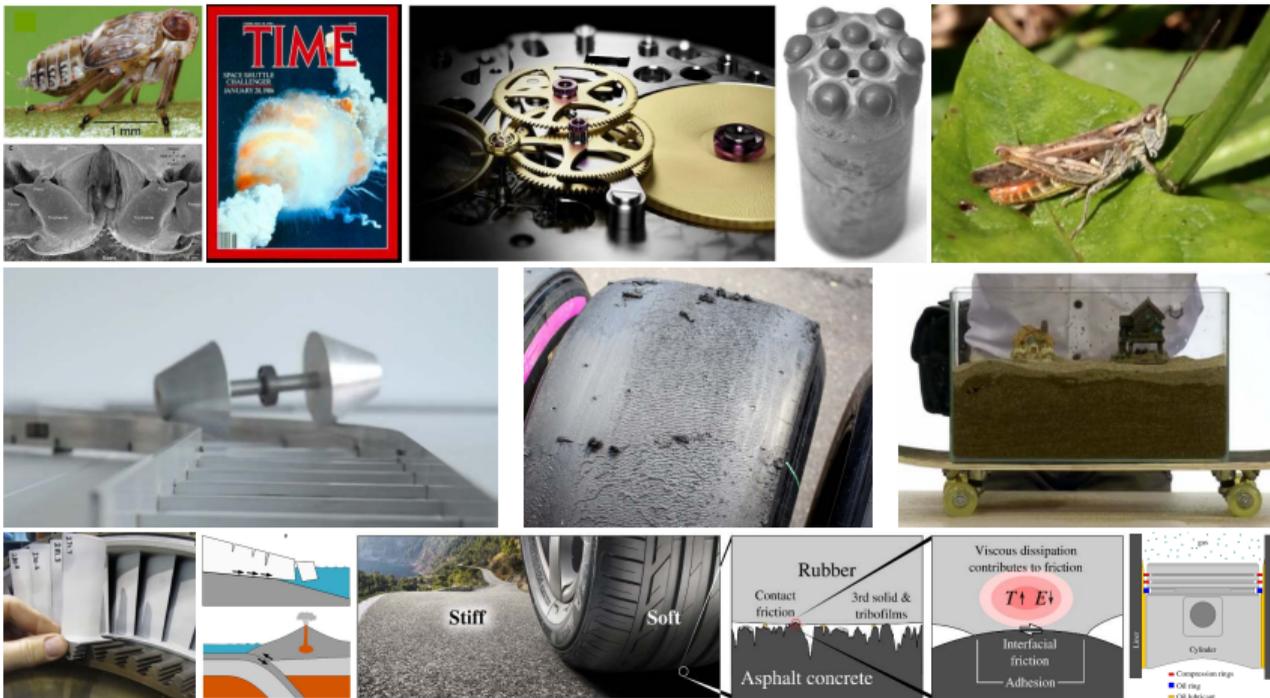
Zoom and operational mode

- We give this course in a hybrid mode, so please be patient with technical problems ☺.
- In case of such problems, please write in Zoom chat, we'll try to solve them asap.
- Please do not record the course, one day, I'll do it on my own ☺
- Please don't share zoom links neither. If someone would like to attend, please write me an email.
- During lectures, I'll accept oral question only from people in the classroom.
- For all Zoom participants, please write your questions in Google.Sheet
https://docs.google.com/spreadsheets/d/1heHpRURmNz6SNh45X32sbCCbD_B2gk50S_tFUH1uM8k/edit?usp=sharing
I'll try to address them asap.
- All slides will be available on cmet.yastrebov.fr
- Feel free to use all my figures and my slides (CC BY license), you simply need to mention the author.

Program

We try to keep theory / practice balanced

Prereading: [Applications](#)



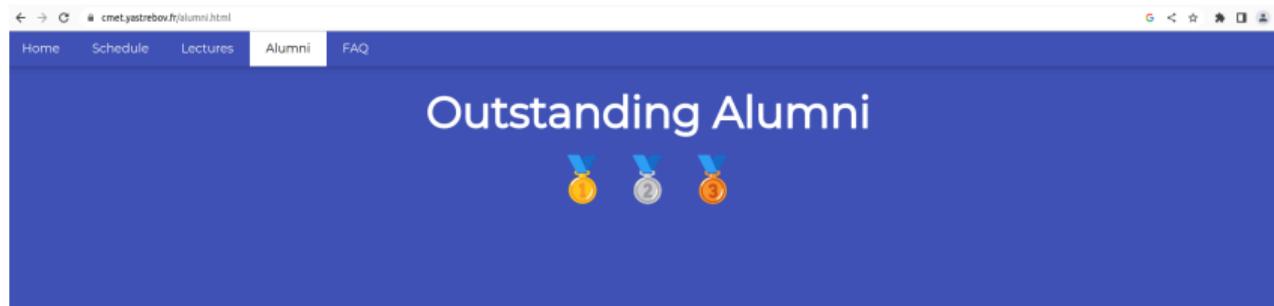
Exam, certificates & notes

- On Friday, February 27th at 13h30.
- 20-25 questions
- Duration: 2 hours 30 minutes
- Type of questions: technical questions which generally require some calculations
- Please take notes during the class, I give extra information on the "blackboard"
- You will be allowed to use any notes but no devices ☺
- Final notes are essential for DMS participants to validate the course

Outstanding alumni receive a diploma and appear on the dedicated web-page ☺



Outstanding alumni receive a diploma and appear on the dedicated web-page ☺



2023

- Rémy DUQUESNE
- Amirhossein ZABIHI
- Tatyah ARJUNA
- Samer SEMAAN

2022

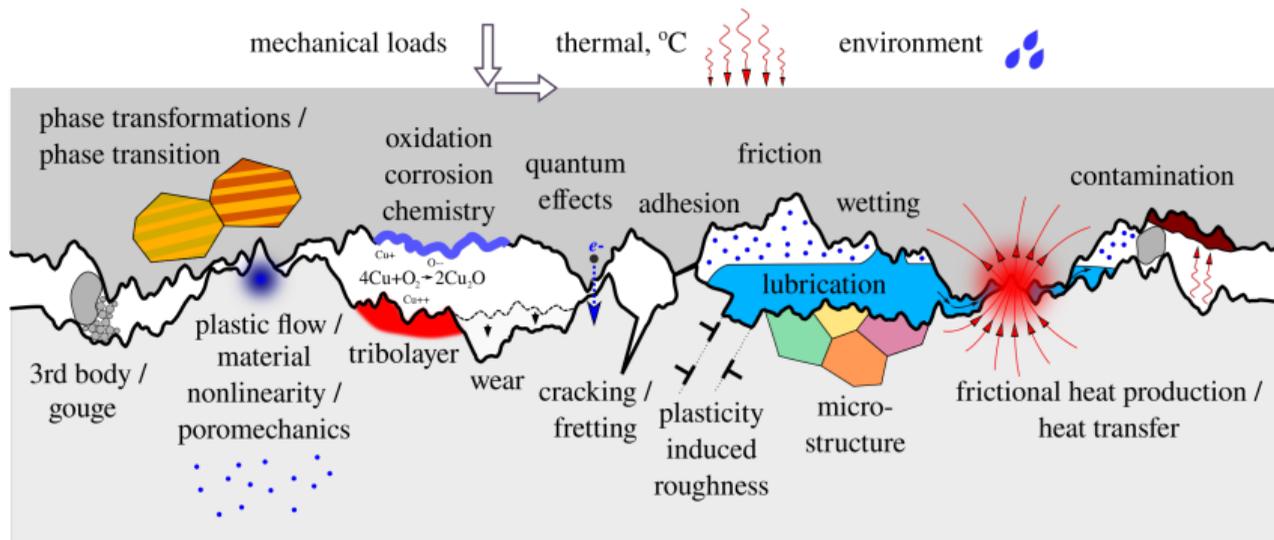
- António Manuel Couto Carneiro
- Quentin Caradec
- Rodrigo Pinto Carvalho
- AHYEE Anuskee
- Victor Pinardon
- Michon Audrey
- Pierre Gantier



Contact complexity: physics and mathematics

Particular difficulties related to contact problems: multiphysical aspects, mathematical aspects

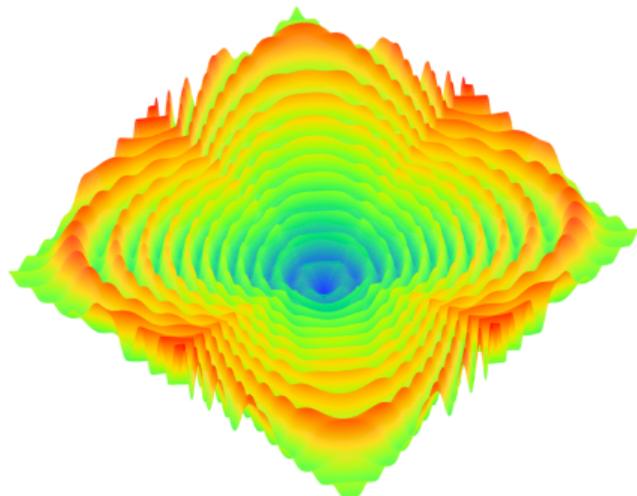
- Roughness of surfaces
- Interface chemistry
- Hardly accessible contact interface for measurements
- Generation and diffusion of heat
- Multiscale and multiphysical nature of friction



Contact complexity: physics and mathematics

Particular difficulties related to contact problems:
multiphysical aspects, **mathematical aspects**

- One of the most hard problems in mechanics
- Lack of standard optimization problem
- Non-convexity and non-differentiability
- Bad scalability





Welcome to the CMET course!
