

Oferta: Prácticas Curriculares + Trabajo fin de Master

Área de trabajo:

Simulación y Análisis de problemas Aeromecánicos en Turbomaquinaria

(vinculado al proyecto Europeo EU-H2020 ARIAS, <https://www.arias-project.eu/>)

- Fecha de comienzo: Enero de 2022
- Número de plazas: 5
- Tema de los PC+TFM: Problemas de Aeroelasticidad, Flujo en cavidades, Estabilidad de Sellos, Efectos de Fricción, ...
- Los alumnos tendrán financiación para seguir el curso “Aeromechanics Project Course” impartido por KTH Stockholm, TU Darmstad, Imperial College London, and University of Stuttgart. Es un curso online de 3 ECTS con una visita de 1 semana presencial a KTH Stockholm (ver documentación adjunta)
- Perfil del candidato: Estudiante de MUIA con buena formación en Mecánica de Fluidos, Elasticidad y Resistencia de Materiales, Métodos Matemáticos y Cálculo Numérico, e interés por la simulación numérica de fenómenos físicos.
- Plazo: **hasta el 10 de Noviembre de 2021**
- Interesad@s enviar CV y expediente académico a

Carlos Martel (carlos.martel@upm.es)

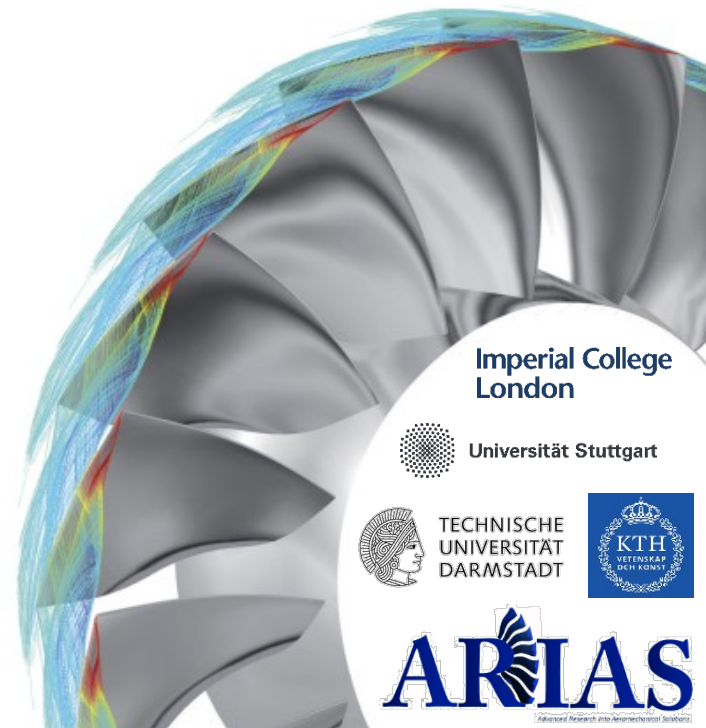
Depto. Matemática Aplicada a la Ing. Aeroespacial
ETSI Aeronáutica y del Espacio
Universidad Politécnica de Madrid.





International Collaborative Student Project Aeromechanics Project Course

- » Student project within the framework of *EU-H2020 ARIAS*
- » Collaboration of KTH Stockholm, TU Darmstadt, Imperial College London and University of Stuttgart
- » Interactive web-based course with focus on aeroelasticity
 - » *Introduction lectures & literature reviews*
 - » *Tutorials*
 - » *Advanced Research Project*
 - » *Guest lectures (specialists from industry and academia)*
- » ~20 Master students/ early PhDs in multi-national teams
- » Time frame: January – May





ARiAS project



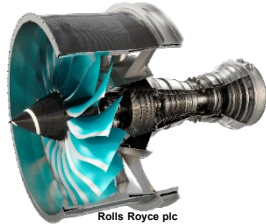
- » **A**dvanced **R**esearch into **A**eromechanical **S**olutions
- » European (H2020) funded research project
- » All aero engine and gas turbine companies in Europe and leading academia partners (19 partners / 7 nations)
- » Joint approach to enable comprehensive understanding of aeroelasticity phenomena
- » Improvement of predictive capability of methods with unique high quality measurements
- » Foster European collaborative (net-)work within research and education
- » More Info @ <https://www.arias-project.eu/>



Aeromechanics Project Course

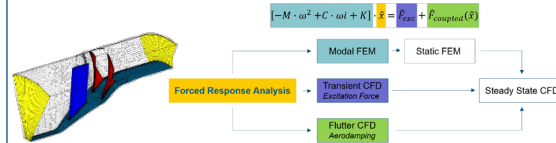
Motivation

- » Aerospace & energy applications
- » Interdisciplinary topics
- » Future challenges



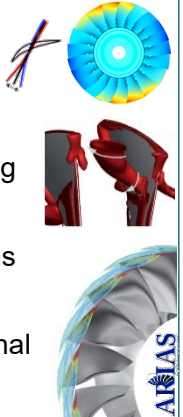
APC

- » Lectures, tutorials & literature review
- » Collaborative student group projects
- » Guest lectures




Goals

- » Theoretical background
- » Research oriented learning
- » Tool training & applications
- » Train to work in international teams



Organization

- » based on project course within KTH MSc program 
- » Student are obtaining ECTS credits in corresponding courses at home universities
- » zoom live-events & recordings
- » exchange via KTH Canvas platform
- » varying lecturers
- » student licenses & hardware access



Course Intended Learning Outcomes

- » **After completing the course the students will be able to:**
- *describe and explain common aeromechanic phenomena in turbomachines such as flutter, forced response and non-synchronous vibrations (NSV)*
 - *plot and interpret a Campbell diagram*
 - *analyze the current literature on turbomachinery aeromechanics*
 - *explain the main assumption behind the standard methods used to analyze turbomachinery aeromechanics*
 - *determine the fundamental structural modes of a turbomachine blade by using a state-of-the-art commercial FE software*
 - *perform steady and unsteady flow simulations of a turbomachine stage using a state-of-the-art commercial CFD software*
 - *perform aerodamping analysis of turbomachinery blade row*
 - *perform complete forced response analysis and determine the blade vibration amplitudes and related stresses*
 - *present and describe the results of an aeromechanical analysis*

Course layout and time plan

Lectures

8 weeks

Varying International Lecturers

Project Period

6 weeks

Collaborating International Groups

Tutorials

8 weeks

Collaborating International Groups

Literature Review

3 weeks

Collaborating International Groups

Guest Lectures

5 events

Industry & Academia

Research Question

Symposium

Presentation

Research partner

Collaboration (all groups)

Jan

April

May