# ERCOFTAC Hybrid RANS-LES Methods for Industrial CFD
## 22-23 May 2017, Univ. of Manchester, UK

| | Monday 22 May 2017 | |
|---|---|---|
| 9:00 | **Registration & Coffee** | |
| | *Overview* | |
| 9:30 | Fundamentals of turbulence and turbulence modelling, RANS (in relation to hybrid RANS-LES modelling) | **Dr. T. Craft** |
| 11:30 | **Refreshment** | |
| | *Modelling Approaches and Industrial Applications* | |
| 12:00 | Advanced URANS and SAS | **Dr. F. Menter** |
| 13:00 | **Lunch** | |
| 14:00 | DES and enhanced versions | **Dr. F. Menter (presenter) & Prof. M. Strelets** |
| 16:00 | **Refreshment** | |
| 16:30 | **Q&A** | **All** |
| 17:00 | **Close** | |

| | Tuesday 23 May 2017 | |
|---|---|---|
| 8:30 | **Coffee** | |
| | *Modelling Approaches and Industrial Applications* | |
| 9:00 | Hybrid RANS-LES modelling and applications | **Prof. S.H. Peng** |
| 11:00 | Refreshment | |
| 11:30 | Embedded LES, and RANS-LES interface | **Dr. A. Revell** |
| 12:30 | **Lunch** | |
| | *Recommendation & Guidances* | |
| 13:15 | Inflow turbulence conditions and modelling-related numerical issues | **Dr. A. Revell** |
| 14:15 | Implementation and Validation SAS,DES & variants, embedded LES and other hybrid RANS-LES methods | **ALL** |
| 15:15 | Refreshments | |
| 16:00 | Q&A | |
| 16:30 | Close | |
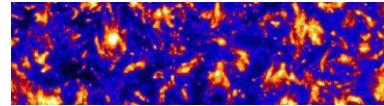
## Aims

Turbulence is one of the last remaining challenges in the simulation of fluid flows. Although RANS (Reynolds-Averaged Navier Stokes) turbulence models are still very widely used, these approaches are being slowly supplanted by Large Eddy Simulation (LES). However, LES is prohibitively expensive for the industrial simulation of wall-bounded flows, especially at high Reynolds number. As a result, a family of Hybrid RANS-LES techniques, of which Detached Eddy Simulation (DES) is one member, are being increasingly used for the modelling of flow in and around complex geometries.

Due to the current lack of readily-available expert guidance on the application of Hybrid RANS-LES techniques, and the emergence of DES as the tool of the trade, ERCOFTAC has drawn upon its worldwide network of academic and industrial experts to provide a training course aimed at an industrial CFD audience and relevant to a wide range of industry sectors including: Aerospace, automotive, chemical and process, civil and built environment, power generation and the wider engineering community. Specifically, this course aims to provide:

- An overview of turbulence modelling.
- A firm foundation in the theory and ideas underlying, RANS, LES and Hybrid RANS-LES techniques.
- Recommendation and guidance for the appropriate and effective application of Hybrid RANS-LES. Examples from real-world engineering simulations, using the SAS, DES & variants and embedded LES and other Hybrid RANS-LES class of models.

**Lecturers**
☐ Prof. Shia-Hui Peng, FOI, Stockholm, Sweden –Course Coordinator
☐ Prof. Michael Strelets, St Petersburg Univ, St. Petersburg, Russia
☐ Dr. Florian Menter, Ansys, Germany
☐ Dr. Tim Craft, Univ. of Manchester, Manchester, UK
☐ Dr. Alistair Revell, Univ. of Manchester, Manchester, UK

**Fees:**
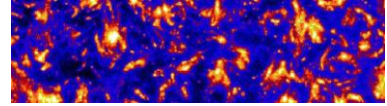Members - €595
Non-Members - €895.

**Fees:** UK
ERCOFTAC
UK members €520,
UK non-members €820
ERCOFTAC
Student UK members: €370,
Student UK non-members €490

Please note fees do not cover accommodation.