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**Meeting of UKFN Executive Committee**

**15:00 Friday 22 September 2017**

**Via Webex**

AGENDA

1. Welcome **new member** of EC, Yannis Hardalupas.
2. Agree the **Minutes** of last EC meeting (30/6/17).
3. Review **outstanding actions** from last EC and AB meetings.
4. Discuss **website**:
  - a. development since last meeting
  - b. next stages
  - c. comments from Neil
5. Discuss **SIGs**:
  - a. report on progress of SIGs
  - b. monitoring SIG activities and expenditure
  - c. future EC interaction with SIGs
6. Discuss **SRVs**:
  - a. applications for third batch
  - b. comments from Yannis
7. Discuss use of **supplementary fund** from project partners
  - a. status of requests and fund
  - b. update on current and future use of supplementary fund
  - c. comments from Steve (via email)
8. Discuss UKFN **engagement with other UK activities**
  - a. UK Fluids Conferences
  - b. ERCOFTAC
  - c. Naked Scientists/JFM
  - d. other
9. Discuss future **interactions with EPSRC**
10. Discuss progress and future plans for **publicity and engagement** with UKFN
  - a. how to improve participation from the UK fluids community, SIGs, etc
  - b. how to attract new members
  - c. using UKFN to promote UK fluids research
11. Any other business
12. Next meeting

*MPJ/NCD, 18/9/17*

Item 3: Outstanding actions from last EC and AB meetings

The following actions from previous EC and AB meetings are ongoing.

**EC (30/6/17):**

- Online fluid resources (Item 3) – ND to continue to pursue existing resources, e.g. downloadable fluids texts, course notes, that are already online and could be linked to from the Researcher Resources page
- 'Join SIG mailing list' on SIG pages (Item 3) – this feature does record subscriptions, but there is an error because the mail server that sends emails (notification to SIG leader and confirmation to subscriber) requires additional setting up, which is in progress
- Dissertation prize (Item 6) – ND to publicize this prize once the overall plan has been approved by the EC and AB; MJ/ND to liaise with Manchester regarding a presentation by the prize winner at the next UK Fluids Conference
- Registration of UKFN members (Item 9) – ND to push once the Directory page is live, which is imminent
- Industrial societies (Item 9) – ND/MJ to investigate use of industrial societies for publicizing the SIGs and UKFN
- Increase website traffic (Item 9) – MJ/ND to pursue ideas with CUP/JFM
- Media champions (Item 9) – ND to pursue setting up media champions in the SIGs, who feed interesting stories from their SIG through to UKFN
- Publicity for APS (Item 10) – ND/MJ to continue adapting the SIG booklet for a non-UK audience and investigating options for distribution at the conference

**AB (29/3/17):**

- Website modifications (Item 3) – suggestions by Ton van den Bremer include showing which SIGs a logged-in user belongs to and adding further interactivity on the SIG map

**EC (23/3/17):**

- Continuum mechanics publicity (Item 8) – Mike Ward to liaise with EPSRC's Comms team on what the UKFN SIGs could provide as input for articles in EPSRC publications

**EC (9/9/16):**

- More series of talks on the Talks page – ND to restart search for more fluids seminar series
- Jobs page – long-term goal, use Twitter and newsletter for now

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| Item 4: Website |
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Development since last EC meeting

**Domain name** (<https://fluids.ac.uk>): the UKFN website has been ported successfully to the new domain name. There have been no reports of difficulties arising from the transfer.

**Home page** (<https://fluids.ac.uk>): @UKFluidsNetwork currently has 460 followers (up from 337). There are over 700 on the mailing list; addition of a Captcha to subscription has largely eliminated the earlier spamming problems.

**Registration page** (<https://fluids.ac.uk/register>): there are 448 registered users (up from 406).

**Connect page** (<https://fluids.ac.uk/connect>): the About page (which combined Admin and Contact) has been re-ordered with the contact form first and renamed Connect to emphasise it is the place to send a message. Other content is organized in groups (Downloads, People, Documents, Reference). Issues 9 and 10 of the UKFN newsletter have been circulated to the mailing list (on 10/7/17 and 22/8/17, respectively).

**SIG page** (<https://fluids.ac.uk/sig>): there has been a minor change adding three buttons (i) to view the SIG calendar, (ii) to direct people wishing to join a SIG to contact its leader and (iii) to note there may be a third call for SIGs in Spring 2018.

**SIG individual pages** (<https://fluids.ac.uk/sig/Acoustofluidics>, etc): the HTML editor is now available and instructions have been emailed to SIG leaders and co-leaders. The UKFN website records each SIG's members list and mailing list, although in the latter case it cannot yet send emails itself (e.g. to notify the SIG leader).

**SRV page** (<https://fluids.ac.uk/srv>): this now shows all 11 SRVs approved in the first and second batches. The four visit reports received so far (3 from Batch 1 and 1 from Batch 2) are available by expanding the SRV.

**Researcher Resources** (<https://fluids.ac.uk/researcher-resources>): although this page has been live since the last meeting, no new resources have been added yet. Regarding other online resources that this page could link to

- ND checked the MAGIC network, and other related taught course networks, but the only course relevant to UKFN was the 'Hydrodynamic Stability Theory' course by Jonathan Healey already noted. Besides general continuum mechanics courses, all others focused on mathematics and not fluids
- further online fluids books (cf turbulence book noted previously) have not been identified so far, but ND will follow up

**Competition page** (<https://fluids.ac.uk/competition>): the first UKFN photo/video competition has run to completion (see Item 7 for further details), and the Competition page has been formatted in three different ways according to the stage in the competition, namely

- (i) call for entries format – displaying how to enter and the competition rules
- (ii) voting format – displaying shortlists of 10 photos and 10 videos, with buttons to vote and email entry to verify voter
- (iii) winners format (current) – displaying the winning photo and video

Next stages

**Directory page:** the next major section under development is the Directory page, which is nearing completion. This will carry out a general search across the entire website, and the search results returned may be filtered by User, Research sub-discipline, etc. For registered users it will display a summary of the personal data they entered on registration.

**Competition page:** this will continue to cycle through the formats described in the previous section. In addition, it is planned that this page will host the follow-up stories from competition entries and winners.

**SIG pages:** The Description section for each SIG will be replaced with the text from its SIG booklet page (see Item 8). This will bring the SIG pages to completion, apart from ongoing edits by the SIGs themselves.

**Connect page:** The SIG booklet will be available for download here.

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| Item 5: Special Interest Groups |
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Status spreadsheet and Dropbox folder

The EC is reminded that the Dropbox folder, *UKFN\_files*, continues to hold a centralized copy of files relevant to the SIGs and SRVs, and is updated periodically, together with the status workbook *SIG\_status\_<date>.xlsx*.

Summary of SIG meetings to date

- 38 out of 41 SIGs have held their first meeting. 2 of the remaining 3 SIGs will have their Kick-off meetings before the end of September, while the third has scheduled it for October/November.
- Of the 38 SIG meetings, 2 SIGs did not wish to claim expenses, while 20 others have submitted expense claims (all approved).
- Of the 40 kick-off meetings with specific dates, 23 are 1-day and 17 are 2-day meetings.
- Many SIGs have decided on (and several have completed) second meetings, with some setting the date for a third (see table in Appendix).

Monitoring SIG activities and expenditure

- MJ completed the round of phone calls to SIG leaders initiated by the EC members, who also passed MJ any notes from their own calls.
- MJ completed a draft of the best practice document or 'SIG Manual', based on all the feedback received. The draft was circulated to the EC and to the SIG leaders for comment. The final version is in preparation and will be made available for download and promoted to SIG leaders. The final version has been sent to SIG leaders and co-leaders.
- MJ has gained a good overall picture of SIG activity through contacting a significant fraction of the leaders directly, and, depending on the outcome of discussions with the EC, is considering the possibility of continuing to contact them regularly.

Would the EC discuss whether each member should continue monitoring a subset of the SIGs, or whether it would be preferable to hand over responsibility to MJ, who would periodically cycle through all the SIGs.

- There has been limited take-up by SIG leaders to cc their EC member on email. This would be discontinued if responsibility is handed to MJ (see above)
- Following the request to all SIG leaders to provide a spending plan by 1/9/17 there are still 25 outstanding, which ND is continuing to pursue.
- The EC members have attended SIG meetings as follows. In general, each person will attend meetings of the SIGs listed, time permitting; an asterisk\* denotes attendance at one or more meetings already.

**AJ:** Fluid mechanics of nanostructured materials\*

Fluid mechanics of the eye

Non-Newtonian fluid mechanics\*

**PL:** Experimental flow diagnostics (xFD)

Low-energy ventilation\*

Surface and internal waves

Urban fluid mechanics\*

**NS:** Flow instability, modelling and control\*

Multicore and Manycore Algorithms to Tackle Turbulent flows (MUMATUR)\*

Non-equilibrium turbulence

- ST:** Flow instability, modelling and control  
Multi-scale processes in geophysical fluid dynamics  
Next generation time-stepping strategies  
Non-equilibrium turbulence
- YH:** Combustion science, technology and applications  
Sprays in engineering applications: modelling and experimental studies\*

- The SIGs will start to produce outputs in due course. These outputs will be noted and compiled during monitoring, and development of a SIG book is under consideration. This would build on the SIG booklet (see Item 8), but would be a more substantial production. It would be funded from the grant, rather than the supplementary funds (Item 7), which will be reserved for competitions etc.

#### Future EC interaction with SIGs

If the EC members transfer responsibility for monitoring SIG activities to MJ, would the EC discuss options for ways to contribute to the website, for example through stimulating submission of Researcher Resources, starting with the SIGs in which they are involved.

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| Item 6: Short Research Visits |
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The third round of applications, ending 30 September 2017, is as follows.

| # | Visitor                                     | Visit title  | Visiting  | Visit dates        |
|---|---|--|---|--------------------|
| 1 | Mr Alistair Rodgers,<br>University of Leeds | The soil removal mechanisms<br>of liquid jets and sprays used<br>in pharmaceutical batch<br>cleaning | Prof Ian Wilson and<br>Mr Rajesh Bhagat,<br>University of Cambridge | 16-27 October 2017 |

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| Item 7: Supplementary funds |
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Status of requests and funds

As reported previously, a total of 21 institutions had offered financial contributions in their letters of support to the UKFN proposal, of which 12 offered specific amounts per year, totalling £8,500 p.a. These were the first institutions that were approached.

To date, there has been a response from 5 of the 12, with funds received totalling £2,000, with payment of a further £1,500 in progress. Reminders have been sent to the other institutions, and we are awaiting the outcome.

Use of funds to date

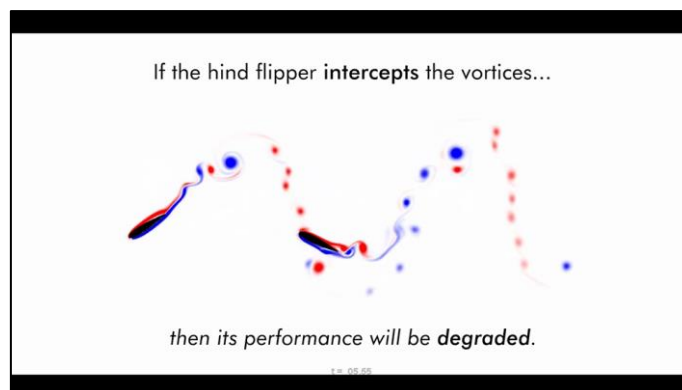
The following expenditure, totalling £700, has been paid from the supplementary funds account.

## (i) UKFN photo/video competition

The competition received 17 entries for photos and 16 entries for videos. Some competitors submitted multiple photos or videos, so 36 photos and 24 videos were submitted in all. ND, MJ and ST drew up shortlists of 10 photos and 10 videos (with a maximum of one entry per competitor in each category), which were then laid out on the Competition page (see Item 4). There was a good response in the available time, with clear winners, who receive £200 each:



*“(Accidental) double diffusive instability” by Megan Davies Wykes (Cambridge)*



*“The hydrodynamics of plesiosaurs” by Luke Muscutt (Southampton)*

Next time, it would be worth investigating switching the order, i.e. using the popular vote to get the two shortlists, and then invite a panel of ‘experts’ to choose the winners.



(ii) Competitions at the 2017 UK Fluids Conference

In conjunction with JFM, prizes were awarded at this year's UK Fluids Conference in Leeds for the best PhD student presentations and posters.

- Presentations: there were almost 60 student talks, each of which was attended by two judges from the panel of four – PL, ST, Paul Bruce (ICL) and Stephen Wilson (Strathclyde). Talks were marked using a standardized score sheet.

The winners were

1st: "The evolution of rising thermals" by Jack Atkinson, Cambridge

Runner-up: "Rates of chaotic mixing: models of fluid devices with discontinuities" by Hannah Kreczak, Leeds

- Posters: there were 35 posters, and these were judged by popular vote, using tokens issued to all conference delegates by UKFN.

The winners were

1st: "Heating models for faceted shapes in atmospheric re-entry flows" by Thomas Rees, ICL

Runner-up: "Fully resolved LES and dynamic mode analysis of turbulent pipe flows with varying bend radius" by Joshua Holgate, Manchester

In both cases the runner-up received a prize of CUP books to the value of £75, while the winner received the books plus £150. Prizes were presented by PL (presentations) and Kathleen Too of CUP (posters).

Future use

Current ideas include the following.

Would the EC discuss ideas for future use of supplementary funds, in particular the thesis prize.

**(i) Repeat competitions**

- Another UKFN photo/video competition, perhaps with a specific theme, rather than general fluids
- Presentation/poster competitions at the 2018 UK Fluids Conference

**(ii) Fluids thesis prize**

The UK Fluids Network dissertation prize will be awarded to the best doctoral thesis on a topic in fluid mechanics submitted to a UK university in a given year. The winner will receive a cash prize and the opportunity to present their work in a plenary session at the UK Fluids Conference.

Note: The following details are largely modelled on the Royal Astronomical Society's Michael Penston Prize (see <http://www.ras.org.uk/awards-and-grants/awards/2278-michael-penston-thesis-prize>). In particular, the prize pertains to theses examined and passed in a specific calendar year, referred to below as the 'prize year', with nominations submitted by a certain date in the following year, in our case 31 March.

*Eligibility*

The thesis must satisfy the following conditions.

- a. The subject of the thesis is within the broad area of fluid mechanics [exclusions?]

- b. The thesis was submitted to a UK university for a doctoral degree (PhD, DPhil, etc.) and passed during the given prize year

*How to enter*

Entry is through nomination by one of the thesis examiners, to reach UKFN by 31 March following the prize year. The nominator will be required to complete a form giving details of the thesis and its author, and to submit a citation of 300 words. In addition, another senior researcher familiar with the work, such as the other thesis examiner, should send supporting statements directly to UKFN by the same deadline.

*Judging*

There will be a judging panel of Y members of UKFN. Each nominated thesis will be assessed by 2[?] panel members, according to a set of criteria [to be specified]. The panel will recommend a winner and runner(s)-up by 31 May following the prize year.

*Prize and follow-up*

There will be a cash prize for the winner. There will not be prizes for the runner(s)-up, but their citations would be published on the UKFN website alongside that of the winner. Subsequently, the winner will be given the opportunity to present their work at the next UK Fluids Conference. They would also be interviewed by The Naked Scientists, and the results used for additional media coverage.

*Timeline (for 2017 prize year)*

- Agree plan with EC and AB by end of October
- Notify SIG leaders and institutional PoCs, and advertise on website, social media, within 2 weeks
- Nominations close 31 March 2018 for 2017 theses  
Panel considers nominations and recommends winner (and possibly runner(s)-up) by 31 May 2018
- Winner's name, title and abstract sent to UK Fluids Conference organizing committee within 2 weeks for inclusion in the conference programme, if they wish to present. (Note this year the successful abstract submissions for UKFC were announced on 26 May, so our schedule would fit well.)

*Questions for the Executive Committee:*

- a. How should we define the scope 'fluid mechanics'? via exclusions? if so, what?
- b. How to provide guidelines for the nominator's citation?
- c. Should there be runner(s)-up as well as a winner? cash for winner only? how much?
- d. How many judges would be required to assess each thesis?
- e. Should there be common criteria for judging? who would formulate them?
- f. Any other publicity ideas besides those mentioned under 'Timeline'?

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| Item 8: Other UK activities |
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UK Fluids Conferences

Besides the presentation and poster prizes (Item 7), UKFN made the following contributions to this year's conference.

- Booklet on SIGs: this consists of a 48-page A5 booklet, principally describing the 41 SIGs, but with additional information on the SRVs, as well as different ways people can get involved with UKFN. The new text for each SIG will be used to replace the brief descriptions currently appearing on the SIG website pages.
- 'Meet the SIG leaders' event: around 60 people came to the lunch, including representatives of 18 SIGs, who each spoke for 1-2 minutes about their SIGs, followed by networking.

| <b>SIG</b>  | <b>Representative</b>   |
|---|-------------------------|
| Acoustofluidics   | Richard Fu**            |
| Biologically active fluids                                      | Otti Croze**            |
| Challenges in cardiovascular flow modelling                     | Alberto Gambaruto*      |
| Droplet/flow interactions with bio-inspired and smart surfaces  | Jining Sun              |
| Experimental flow diagnostics (xFD)                             | Graham Hughes**         |
| Flow instability, modelling and control                         | Yongyun Hwang**         |
| Fluid dynamics of liquid crystalline materials                  | Stephen Wilson*         |
| Fluid mechanics of cleaning and decontamination                 | Julien Landel**         |
| Fluid mechanics of nanostructured materials                     | Lorenzo Botto**         |
| Fluid mechanics of the eye                                      | Oliver Jensen           |
| High speed experimental aerodynamics                            | Paul Bruce**            |
| Low-energy ventilation  | Cath Noakes**           |
| Marine hydrodynamics  | Joe Banks**             |
| Nonlinear waves and interfacial dynamics                        | David Sibley            |
| Multicore and Manycore Algorithms to Tackle Turbulent flows     | Sylvain Laizet**        |
| Multiphase flows and transport phenomena                        | Prash Valluri**         |
| Particulate matter filtration flows in auto/marine applications | Svetlana Aleksandrova** |
| Surface and internal waves                                      | Andrew Lawrie*          |

\*\*leader, \*co-leader

Next year's conference is in Manchester (4-6 September 2018). MJ/ND have initiated contact with Oliver Jensen, who is currently the main contact for the conference. We will explore the possibilities for UKFN to contribute at the same level as a minimum.

ERCOFTAC

UKFN is to take over running the ERCOFTAC UK Pilot Centre from David Standingford (Zenotech Ltd). There has been no formal handover yet, but MJ is attending the ERCOFTAC Autumn Festival and Da Vinci Prize competition at TU Delft (5-6 October), and it is expected the handover will be announced there.

In July, ND produced a new leaflet about UKFN to distribute at the Osborne Reynolds Day at Manchester, which is organised by ERCOFTAC.

### Naked Scientists/JFM

There has been ongoing contact with Tom Crawford of Naked Scientists and Kathleen Too/David Tranah at CUP.

- JFM was present at the UK Fluids Conference and presented the prizes jointly with UKFN.
- CUP was at the recent European Turbulence Conference in Stockholm (21-24 August) and distributed copies of the UKFN leaflet produced for Osborne Reynolds. Feedback from KT indicated there was interest in UKFN from outside the UK – but how could they participate? One possibility is for non-UK researchers to join SIGs and give a presentation, either in person (if the SIG was prepared to fund) or virtually.
- TC is teaming up with Nicole Sharp (FY Fluid Dynamics blog) to cover this year's APS-DFD at Denver (19-21 November). MJ/ND discussed this with TC and CUP in a Webex call (17 August). TC/NS intend to interview people at the conference and share the resulting videos between APS, FYFD, JFM and UKFN. UKFN has agreed to cover TC's expenses to attend. The plan is currently to have three principal types of interview:
  - Gallery of Fluid Motion winners – what is the story behind the research?
  - Presenters – what is their talk about? These would be selected via abstracts
  - 'Man on the street' – roving camera talks to attendees; edited into montages

Each finished interview or montage would be 3-5 minutes, and would be hosted on YouTube, and featured on the FYFD blog and the UKFN website.

TC would also post social media from conference.

MJ/ND have agreed to survey the (ca. 3000!) abstracts when they become available and select a shortlist of 20 or so UK researchers presenting at the conference as potential video candidates. The interviews would be agreed in advance with the speakers on the final list.

TC/NS have the backing of the APS-DFD conference organizing committee, and are taking steps to bring APS itself on board.

| Would the EC comment on the above.

### Other

- UK Acoustics Network  
MJ/ND met with Richard Craster of ICL (26 July) to discuss the newly set-up UK Acoustics Network (<http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/R005001/1>), and to learn from UKFN's experiences. ND subsequently talked to Chloe Stockford (also ICL) about setting up our website. There may be some overlap with UKFN to explore here.
- KTN  
The Formulation<sup>1</sup> team ran an event at SCI in London on 18 September. UKFN were invited but unable to participate, so ND provided Rachael Rowlands Jones with a few slides about UKFN and copies of the new flyer to hand out.
- konfer  
There has been no further contact since the last meeting.

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<sup>1</sup> Combining ingredients in pharmaceuticals, food, personal care products.

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| Item 9: EPSRC |
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MJ/ND spoke with Mike Ward (27 July), following up the discussion at a previous EC meeting, which MW attended. He is leaving his role as a Mathematics portfolio manager, but will follow and assist future developments involving UKFN if possible.

- With regard to exploiting output from the SIGs to promote fluid mechanics/continuum mechanics, MW agreed to discuss this with the EPSRC Comms team, with a view to featuring
  - a blog post on EPSRC website
  - an article in EPSRC's *Pioneer* magazineThere could be input from the SIG leaders, including photographs.
- The next UKFN photo competition could have a theme that relates to the interface between solid and fluid mechanics, as part of helping to grow continuum mechanics.
- There is a plan to increase the proportion of community-led proposals (as opposed to top-down proposals) from 55% to 60%. UKFN's SIGs are clearly in a good position to contribute.
- There is a meeting of all SATs in September, and it will be clearer in the period following this meeting how UKFN can contribute to overall priorities.

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| Item 10: Publicity/engagement |
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The following ongoing activities are addressing additional publicity for and engagement with UKFN.

Increase engagement within UKFN

Those already taking part in UKFN, principally through belonging to SIGs, need to be encouraged to register. A good time to push this may be when the Directory page is live (see Item 4), which directly organises and searches the information supplied at registration. The aim is that visitors to the page will see registration allows them to become part of the Directory and therefore they will be encouraged to do so. MJ/ND are planning to upload all the names of SIG members *en masse* if the SIG leaders supply member lists.

How to attract new members

- Increase website links pointing to the UKFN website – needs further targeted requests
- Publicity literature – we already have (or will have)
  - Letter-fold leaflet (OR Day, European Turbulence Conference)
  - SIG booklet
  - ‘book’ (see Item 7)
- JFM/CUP – haven’t followed up yet

How to promote UK fluids

- Media champions – yet to enact
- Guidelines (in SIG manual) for what are newsworthy stories

## APPENDIX: Meeting status at 22/9/17 (based on information submitted for the SIG booklet)

KEY: Completed Future, definite date Future, indefinite date

| #  | SIG   | #1           | #2                | #3          | #4       |
|----|---|--------------|-------------------|-------------|----------|
| 1  | Acoustofluidics   | 24/05/17     | 16-19/01/18       |             |          |
| 2  | Aeroacoustics   | 05/05/17     | Sep 2017          |             |          |
| 3  | Biologically active fluids  | 12/07/17     | Spring 2018       |             |          |
| 4  | Boundary layers in complex rotating systems                               | 03/04/17     | 31/08/17          | 17-19/06/18 |          |
| 5  | Challenges in cardiovascular flow modelling                               | Oct/Nov 2017 |                   |             |          |
| 6  | Combustion science, technology and applications                           | 28/09/17     |                   |             |          |
| 7  | Drop dynamics   | 03/04/17     | Dec 2017          |             |          |
| 8  | Droplet and flow interactions with bio-inspired and smart surfaces        | 12/04/17     | 23/06/17          | 29/11/17    | Apr 2018 |
| 9  | Evolving interfaces in complex flows                                      | 13/07/17     | 18-19/12/17       |             |          |
| 10 | Experimental flow diagnostics (xFD)                                       | 11/09/17     |                   |             |          |
| 11 | Flow instability, modelling and control                                   | 29/03/17     | Spring 2018       |             |          |
| 12 | Fluid dynamics of liquid crystalline materials                            | 12/06/17     | ?                 | ?           | ?        |
| 13 | Fluid mechanics of cleaning and decontamination                           | 26/01/17     | 03/07/17          | 29-30/01/18 |          |
| 14 | Fluid mechanics of nanostructured materials                               | 14/09/17     |                   |             |          |
| 15 | Fluid mechanics of the eye  | 27/03/17     | 25-26/09/17       |             |          |
| 16 | Granular flows in the environment and industry                            | 30/03/17     | 13-14/09/17       |             |          |
| 17 | Ground vehicle aerodynamics   | 25/05/17     | 13-14/11/17       |             |          |
| 18 | High speed experimental aerodynamics                                      | 14/09/17     |                   |             |          |
| 19 | Low-energy ventilation  | 29/03/17     | 19/12/17          |             |          |
| 20 | Marine hydrodynamics  | 30/05/17     | 28/11/17          |             |          |
| 21 | Mathematical challenges of non-linear waves and interfacial dynamics      | 25-26/09/17  |                   |             |          |
| 22 | Multicore and Manycore Algorithms to Tackle Turbulent flows               | 04/09/17     | Apr 2018          |             |          |
| 23 | Multiphase flows and transport phenomena                                  | 04/05/17     | Dec 2017          |             |          |
| 24 | Multi-scale and non-continuum flows                                       | 05/05/17     | 27/09/17          |             |          |
| 25 | Multi-scale processes in geophysical fluid dynamics                       | 22/09/17     |                   |             |          |
| 26 | Next generation time-stepping strategies                                  | 18/05/17     | 11-12/12/17       |             |          |
| 27 | Non-equilibrium turbulence  | 23/03/17     | Mar/Apr 2018      |             |          |
| 28 | Non-Newtonian fluid mechanics   | 06/07/17     | 11-12/01/18       |             |          |
| 29 | Nuclear thermal hydraulics  | 24/05/17     | Early 2018        |             |          |
| 30 | Numerical optimisation with fluids  | 09/05/17     | 24-26/10/17       |             |          |
| 31 | Particulate matter filtration flows in automotive and marine applications | 15/05/17     | 11/09/17          |             |          |
| 32 | Quantum fluids  | 21/06/17     | Dec 2017/Jan 2018 | Apr 2018    |          |

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|    |  |          |              |            |          |
|----|--|----------|--------------|------------|----------|
| 33 | Smoothed particle hydrodynamics (SPH)                                  | 12/07/17 | Apr 2018     | Sep 2018   | Jul 2019 |
| 34 | Sprays in engineering applications: modelling and experimental studies | 12/06/17 | 4-5/12/17    |            |          |
| 35 | Surface and internal waves   | 31/08/17 | Feb 2018     |            |          |
| 36 | Turbulent free shear flows   | 19/05/17 | Nov/Dec 2017 |            |          |
| 37 | Turbulent skin-friction drag reduction                                 | 21/02/17 | ?            |            |          |
| 38 | Urban fluid mechanics  | 30/03/17 | 18/12/17     |            |          |
| 39 | User's forum for National Wind Tunnel Facility                         | 24/01/17 | ?            | ?          |          |
| 40 | Wave turbulence  | 08/05/17 | 11-12/12/17  | 9-11/04/18 |          |
| 41 | Wave-structure interaction   | 27/07/17 | 25/10/17     | May 2018   |          |