UKAN PA SIG 1st meeting, March 13, 2018, Milton Keynes, UK

**Present:**

Giulio Dolcetti (Sheffield)

Sofia Lehmann (CarbonAir)

Mike Swanwick (Rolls Royce)

Keith Attenborough (OU)

Shahram Taherzadeh (OU)

Alex Stronach (OU)

David Berry (University of Evora, Portugal)

Artur Gower (Manchester)

Nick Ovenden (UCL)

Olga Umnova (Salford)

Valerie Pinfield (Loughborough)

**Apologies:**

Daniel O’Boy (Loughborough)

Haydar Aygun (South Bank)

Robin Cleveland (Oxford)

Tatsuki Fushimi (Bristol)

Rod Morris-Kirby (Adler Pelzer)

Ben Cox (UCL)

David Green (Blacknest)

**Introduction (Olga Umnova)**

Many good ideas were generated during our Launch Event meeting. Now we need to decide how we will realise of these ideas.

**1. Presentations from PA SIG members**

**2. Common research themes**

These have been identified as

* Sound propagation in complex environments (e.g. periodic structures, random media, suspensions, emulsions, bubble clouds)
* Interaction of sound with different types of waves (e.g. acousto-optics, photo-acoustics, seismo-acoustics)
* Nonlinear acoustics
* Acoustic sensing (e.g. surface and bulk condition monitoring)
* Sound generation, design of acoustic fields

It was decided that the themes will be available through website and the group members will choose what they are interested in.

**3. Engagement with industry**

One of the aims of the PA SIG is to increase awareness of the industrial community about physical acoustics and attract more industrial members to the SIG and to encourage interaction between the industry and academia. This interaction is beneficial for both sides – industry is kept up to date with the latest scientific developments and has a chance of implementing them while research in academia is more focused around problems important for the industry (better chances for funding too!).

The realm of the physical acoustics is often misunderstood. The public and sometimes industry seem to perceive physical acoustics as an area of acoustics which deals exclusively with exotic and rarely occurring phenomena. This is not the case, as sound interaction with complex media is relevant to many industrial applications. Contrary to more applied acoustics branches, physical acoustics concentrates on fundamental understanding of wave-structure or wave-wave interactions. Consequently, physical acousticians could provide industrial community with better prediction methods and better measurement techniques.

What we decided to do:

1. It was decided that a website will be created with visual content summarising the group area of expertise (“Lindsay’s wheel of Physical Acoustics” similar to Lindsay’s wheel of acoustics). This will explain in simple terms what we do and what knowledge we can offer. This “wheel” will show connections with other SIGs and perhaps relevance of each research theme to industrial applications. The website will be linked to IOA website and its contents will be shared with IOA members most of whom are acoustic consultants.
2. It was decided that in 2019 a workshop (sandpit) Waves in Complex Media for industrial partners will be organised.
3. It was decided to have a range of interactive materials on different types of waves on PA SIG website.

Actions:

Nick Ovenden has agreed to be responsible for the links with industry

Mike Swanwick and Olga Umnova will work on Lindsay’s wheel of physical acoustics.

Artur Gower and Keith Attenborough will work on demonstrations of different types of waves.

**4. Training events, PhDs and ECIs**

It is not feasible to organise separate training schools in PA. However, we should organise training events in cooperation with other SIGs or on UKAN level. A large training school is planned together with EAA in Summer 2019 and PA SIG should actively participate in it. This means organising lectures and tutorials on the topics relevant to PA. The role of future PA SIG website is important – content generated by PhD students and ECIs is welcome. Can we have short presentations of all PhD projects in the area of PA on the website?

Who is doing what: All. Sofia Lehmann and Giulio Dolcetti have agreed to be responsible for organisation and communication with ECIs and PhDs

**5. Links with IOA and IOP PA groups, workshops and conferences**

Mike Swanwick spoke about the links with IOA. IOA and UKAN co fund Materials and Metamaterials workshop on Sept 20, 2018. It is decided to make this event regular (once a year) and devote it to different areas of physical acoustics. IOA has secretaries who can organise events, but IOA and UKAN PA groups will set a scene.

What was decided:

There are already a large number of conferences and workshops in Physical Acoustics so it might be unfeasible for PA SIG to try and organise more. Our focus should be on co organising and supporting existing events, helping to increase their audience and make them more popular instead of fighting for the fraction of the same audience.

Actions:

O. Umnova to communicate with IOP PA group.

**6. Scientific collaboration between PA SIG members**

Encouraging collaboration and joint grant applications is the main aim of this SIG.

UKAN has funding for short visits of PhD students and ECIs. Application form is here https://docs.google.com/forms/d/e/1FAIpQLSfUqYhYWPNWVjmeseizssleV-uTjEZnN3vKW59L--t8\_yhvHA/viewform

Group members should encourage their students to apply. But first we must identify possible topics for collaboration.

Based on the presentations of the group members here is the list of topics which were mentioned more than once:

1. Near field interactions in different environments – bubble clouds, clusters of particles suspensions and emulsions, metasurfaces
2. Surface waves in different environments and surface characterisation
3. Coupling of codes for sound propagation in different environments, including nonlinear problems
4. Nonlinear acoustic problems at different scales – from microfluidics to outdoor sound propagation

What was decided:

Nothing yet, but at least we know more about each other’s interests. Short presentations from this meeting should be available to all possibly through restricted area of UKAN website.

**7. Core Group structure**

Umnova, Taherzadeh, Dolcetti – Coordinator and deputy coordinators

Swanwick, Umnova – links with IOA and IOP Physical Acoustics groups

Gower and Attenborough – website coordinators

Ovenden – links with industry

Lehmann, Dolcetti – organisation and communication with PhD and ECIs

**8. Next meeting**

It was decided that Core Group will meet before mid July to review the progress of group activities. The date and agenda for the next PA SIG meeting should be decided during this meeting and the spending plans agreed.