

# Energy Harvesting

An EPSRC Funded Network

[www.eh-network.org](http://www.eh-network.org)

**EPSRC**

Engineering and Physical Sciences  
Research Council

# Energy Harvesting 2013

Prof Steve Beeby  
University of Southampton  
25<sup>th</sup> March 2013



## Introduction

- Network Background
- Review of Activities
  - Recruitment and Membership
  - Workshops
  - Dissemination events
  - EH open access vibration database
- The Future of the Network
- Today's event

## Network Background

- Motivated by a strong background in Energy Harvesting in the UK/Europe, the potential for new applications and the need to identify new research challenges identified by bringing the community together.
- Started 01 March 2010, funded by EPSRC for 3 years.
- Managed on behalf of the community by Southampton University (PI Steve Beeby, CI Geoff Merrett, Kai Yang) plus Simon Aliwell and Costis Kompis.

## Network Objectives and Activities

- Establish steering board from the research and user community
- Network members will be recruited
  - 365 Members
- Build links with other relevant networks and organisations –
  - Links established with the Materials and Electronics, Photonics and Sensors KTN's, the Energy Harvesting Special Interest Group and IDTechEx.
- Organise 3 facilitated themed workshops to explore both cross cutting technology challenges and applications domains and draw out the specific research challenges that need to be met:
  - Workshop 1, EH from Human Power
  - Workshop 2, EH for Structural Monitoring
  - Workshop 3, MEMS/NEMS Energy Harvesting

## Network Objectives and Activities

- Publish the research challenges and inform research funders (e.g. EPSRC, MRC, EC FP7, TSB)
  - Roadmaps produced for each workshop,
  - meetings held with EPSRC, EC.
  - Supported TSB workshop on Energy Harvesting and a TSB competition (£1.25m budget) recently completed.
- Build an interactive web presence to act as a focus for information sharing, provision of online events, electronic newsletters and a range of resources.
  - Completed, resources include downloadable real vibration data from numerous applications (see <http://eh-network.org/data/index.php>).
- Organise 3 annual industry-academia dissemination events will be held with international speakers invited
  - Done, this is the third!

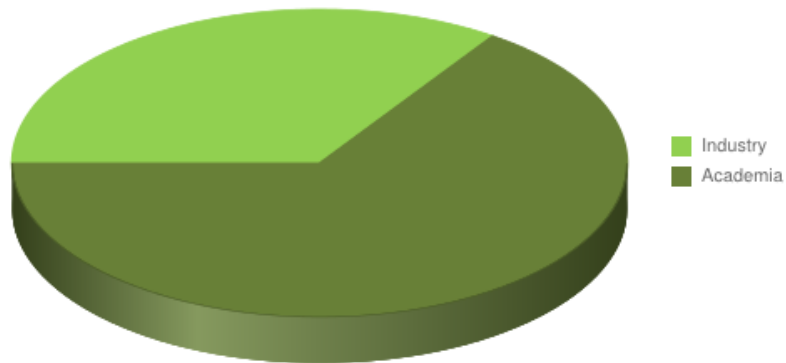
## Network Objectives and Activities

- Promote the network and its findings at various external events and conferences as well as through the provision of articles for the trade press and newsletters of linked networks and organisations.
  - Steering Board members have actively promoted the network
- The network will help support the energy harvesting elements of a PowerMEMS Conference and will bid to host an energy harvesting session of at least one broader themed major conference.
  - PowerMEMS 2013 will be held in London
- Training courses will be developed and delivered by the network members
  - PowerMEMS includes a 2 day school including lectures from leading authorities from around the world

## Membership

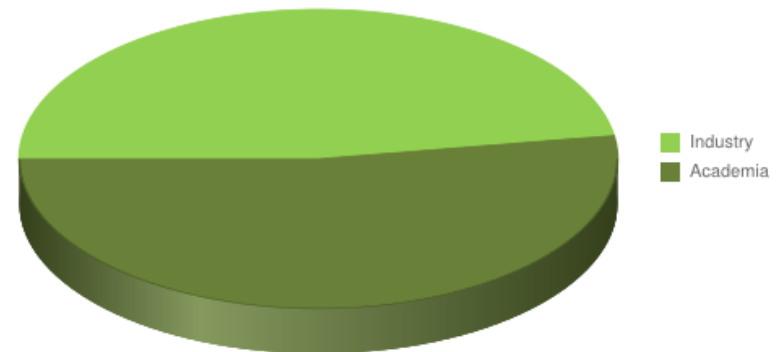
- Open to all with an interest in energy harvesting
- A total of 365 people from 301 companies and institutions

Registered Members



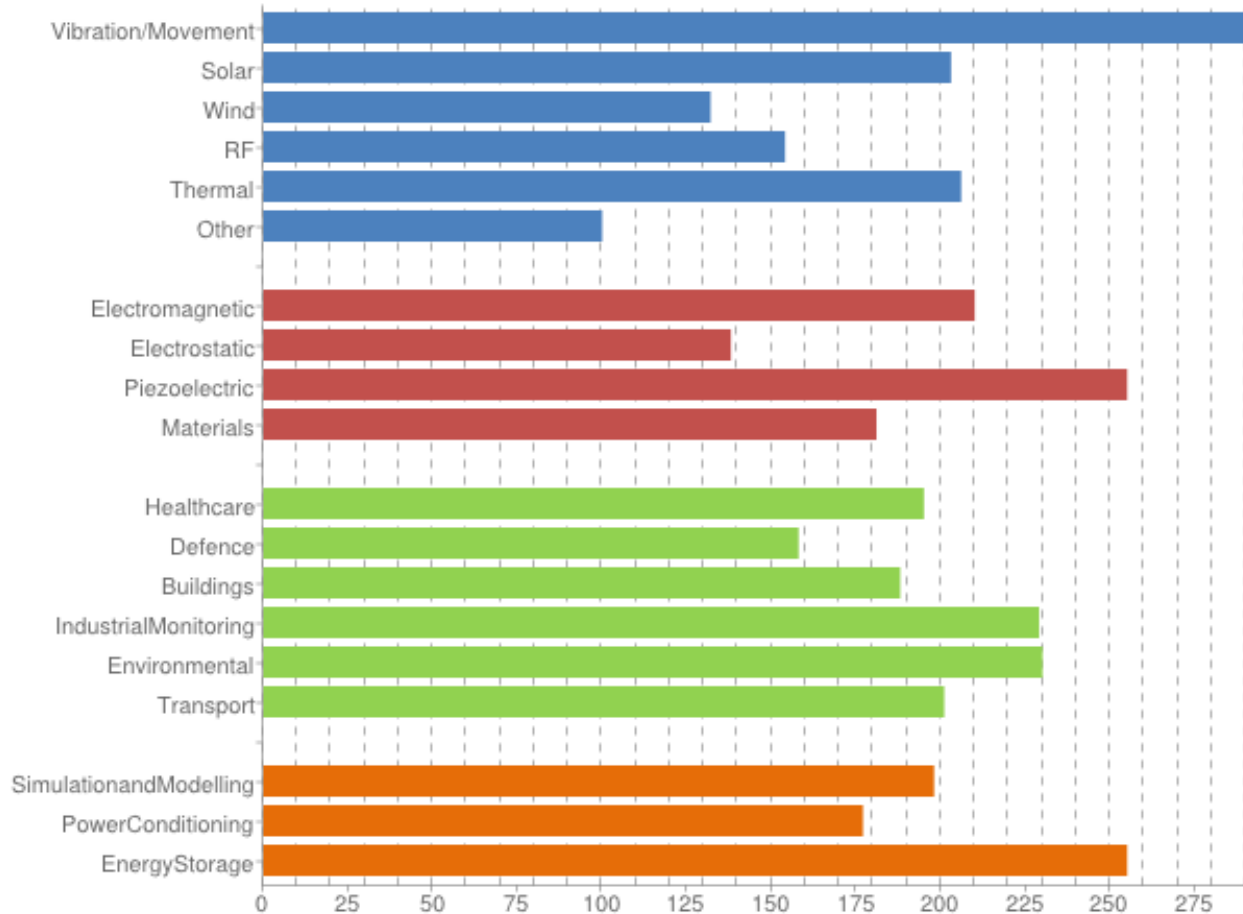
*126 industrial members and  
239 academic members*

Registered Companies/Institutions



*143 industrial companies and 158  
academic institutions*

## Member interests





## The Future

- EPRSC funding ceases at the end of the week!
- Steering Board discussed sustainability and the following have been agreed:
  - Network Webpage will continue to be maintained at Southampton
  - Annual dissemination events will continue
  - Event organisation to rotate around the steering board
  - Steering Board maintain its involvement
- Please complete feedback forms to help with this – suggestions welcome!

## Agenda: AM

<b>9.15</b>	<b>Arrival, Registration and Coffee</b>
09.45	Welcome and Introduction <i>Steve Beeby, University of Southampton</i>
09.50	<b>Keynote:</b> The role of <u>Microenergies</u> : why studying micro energies can push the autonomous sensor market and the future of computing at once. <i>Luca <u>Gammatoni</u>, <u>Università di Perugia</u></i>
10.20	Microfabricated Thermoelectric Devices on Silicon Substrates <i>Douglas Paul, University of Glasgow</i>
10.40	<u>Commercialising</u> your ideas with Knowledge Transfer Partnerships <i>Neil Grice, KTP advisor</i>
<b>10.55</b>	<b>Coffee Break and Networking</b>
11.15	Vibrational Energy Harvesting for Civil Infrastructure Monitoring <i>Ashwin Seshia, Cambridge University</i>
11.35	Piezo Film for Energy Harvesting <i>Richard Brown, Measurement Specialties</i>
11.55	'Elevator Pitches' from Companies with Stands at this Event
<b>12.10</b>	<b>Buffet Lunch and Poster Session</b>

## Agenda: PM

13.40	<b>Keynote:</b> Energy harvester powered sensors: A holistic approach <i>Paul Mitcheson, Imperial College London</i>
14.10	European Thermodynamics <i>Kevin Simpson, European Thermodynamics</i>
14.30	Development of Energy Harvesting Powered Wireless Communication Systems for Energy Autonomous Sensing <i>Meiling Zhu, Cranfield University</i>
<b>14.50</b>	<b>Best Poster Award, Coffee Break and Networking</b>
15.10	<b>Keynote:</b> Energy Harvesting – Progress and Challenges <i>Roy Freeland, President Perpetuum Ltd; Chairman of the 100.18 standards committee</i>
15.40	Zinc Oxide <u>Nanorod</u> P-N Junction-Based Piezoelectric Energy Generators <i>Steve Dunn, Queen Mary, University of London</i>
16.00	Piezoelectric energy harvesting at Morgan <i>Frederick Pimparel, Morgan Electroceramics</i>
<b>16.20</b>	<b>End of Event</b>



[Welcome](#) | [General info](#) | [Program](#) | [School](#) | [Authors](#) | [Commercial Support](#) | [Attendees](#) | [Venue/Location](#) | [Contact](#)

**News:**

The first PowerMEMS school will be launched at the 2013 workshop

**Important Dates:**

**Abstract Submission**  
July 12, 2013

**Author Notification**  
August 19, 2013

**Early Bird Registration**  
September 27, 2013

**Final Papers Due**  
October 4, 2013

**PowerMEMS School**  
December 2 - 3, 2013

**Welcome to PowerMEMS 2013**

**The 13th International Conference on Micro and Nanotechnology for Power Generation and Energy Conversion Applications**

Incorporating IWWETH 2013 (The 3rd International Workshop on Wireless Energy Transport and Harvesting )

**December 3 - 6, 2013**  
London, UK

**Conference Co-Chairs:**  
Stephen Beeby, University of Southampton  
Paul Mitcheson, Imperial College London

**Conference Location:**  
The Royal Society  
6-9 Carlton House Terrace  
London SW1Y 5AG

**Please visit: <http://powermems2013.org/>**