Curriculum Vitae

UNIVERSITY OF Southampton

Timothy Grant Leighton FRS FREng FMedSci ScD

MA PhD CPhys CEng FInstP FIOA FASA

Born: 16-10-63 **Publications:** http://tinyurl.com/gnr5ep7 **Email:** tgl@soton.ac.uk **Tel:** +44 23 80 592291

The Royal Society set up a Wikipedia page: https://en.wikipedia.org/wiki/Timothy_Leighton

1. Current positions

2018 – current Director and Inventor-in-Chief, Sloan Water Technology Limited https://tinyurl.com/yxthdtxh

2016 – current Founder and Chair, Global-NAMRIP (Network for AntiMicrobial Resistance and Infection Prevention) https://tinyurl.com/ycdkh92u

2015 – current Founder and Chair, NAMRIP (UK) (Network for AntiMicrobial Resistance and Infection Prevention), University Strategic Research Group, University of Southampton, UK http://tinyurl.com/h5f8k9b

2015 – current Founder and Chair, HEFUA (Health Effects of Ultrasound in Air), UK special interest group https://tinyurl.com/y8hbpwcq

1999 – current Professor of Ultrasonics and Underwater Acoustics, Institute of Sound and Vibration Research, University of Southampton, Highfield, Southampton SO17 1BJ UK (chair of the **Fluid Dynamics and Acoustics Group**, 2006-2015).

2. Medals and awards

ACADEMICIAN of 3 National Academies: • the Royal Society; • the Royal Academy of Engineering; • the Academy of Medical Sciences.

MEDALS: • the 2017 Clifford Paterson Medal and Lecture of the Royal Society • the 2014 Rayleigh Medal of the Institute of Acoustics; • the 2013 Helmholtz-Rayleigh Interdisciplinary Silver Medal of the Acoustical Society of America; • the 2009 R W B Stephens Medal of the Institute of Acoustics; • the 2006 Paterson Medal of the Institute of Physics; • the inaugural (2004) Early Career Medal and Award of the International Commission of Acoustics; • the 2002 Tyndall Medal of the Institute of Acoustics; • the 1994 A. B. Wood Medal of the Institute of Acoustics.

AWARDS: • 2019 Doctor of Science, University of Cambridge • 2018, a Royal Society Lord Leonard and Lady Estelle Wolfson Foundation Translation Award, for the StarHealer invention • the 2017 'Wow Factor and Impact' Public Engagement prize at the 2017 'Bringing Research to Life' roadshow awards for NAMRIP exhibition 'The Most Dangerous Game in the World'.• the 2016 'Wow Factor and Impact' Public Engagement prize at the 2016 'Bringing Research to Life' roadshow awards for NAMRIP contribution to Cheltenham Science Festival.• the 2014 'Product of the Year' for StarStream™ (S-lab); • the Institute of Chemical Engineering 2012 Award for "Water Management and Supply" for StarStream™**;** • the 2011 Royal Society Brian Mercer Award for Innovation for StarStream™; • the 2008 'Medical & Healthcare' award from 'The Engineer' for LithoCheck™; • the inaugural (2001) International Medwin Prize for Acoustical Oceanography from the Acoustical Society of America.

OTHER FELLOWSHIPS: • Fellow of the Institute of Acoustics; • Fellow of the Institute of Physics; • Fellow of the Cambridge Philosophical Society; • Fellow of the Acoustical Society of America.

3. Biographies (2 have been written):

• Kenward, M. (2017) A talent for bursting bubbles. *Ingenia*, **73**, 38-42 https://tinyurl.com/y97rwofl

• Webb, J. (2016) Resistance fighter takes the battle to microbes, *New Scientist* **229**(3066), 32-33 (doi: 10.1016/S0262-4079(16)30523-1) https://tinyurl.com/zj75qzg

4. Education

Years	University	Degree
85-88	Cambridge	PhD (Cavendish Laboratory, University of Cambridge)
82-85	Cambridge	BA Hons (Natural Sciences): Double First Class Honours in Physics & Theoretical Physics (highest mark of the year for experimental project)

5. Career

2016	Founder & Chair, Global-NAMRIP
2015	Founder & Chair, NAMRIP & HEFUA
2009	Associate Dean (Research), Faculty of Engineering & the Environment
2007	Deputy Head of ISVR
1999	Prof., Ultrasonics & Underwater Acoustics, Uni Soton

1997	Reader, ISVR, Uni Soton
1992	Lecturer, ISVR, Uni Soton
1991	Senior Res. Fellow (Magdalene College, Cambridge Uni) & SERC Adv. Fellowship
1988	Research Fellow (Cambridge Uni) & SERC Postdoctoral Fellowship

6. Leadership in conducting research and taking it out to societal benefit

CITATIONS

- I am an Academician of three National Academies. On my election to the Academy of Medical Sciences in 2018 for "*harnessing the physical sciences for the benefit of patients*", the **citation** reads:

  > "*an outstanding academic inventor whose leadership in acoustical physics of bubbles has led to the development of new medical devices and procedures. His research has dominated the field of acoustic bubbles since the appearance of his monograph in 1994, 'The Acoustic Bubble', which was published at the age of 29. In this, he laid out the mathematical foundation upon which much of the recent cutting edge research on ultrasonic contrast agents, drug delivery, and focused ultrasound surgery has been based. He has exceptional ability to deliver engineering solutions to real world problems from conceptualisation to product development embracing an advanced practical knowledge of IP strategy*".

- The **citation** on 2014 election to Fellowship of the Royal Society reads:

  > "*Timothy Leighton is distinguished for his research on the acoustical physics of bubbles, especially their nonlinear behaviour; for his inventions and discoveries including bubble measurements in the surf zone, pipelines and methane seeps; for shock wave lithotripsy monitoring, disease detection in cancellous bone and needle free injection; for sonar systems that overcome bubble masking and numerous industrial applications. His seminal monograph The Acoustic Bubble has become the primary reference on bubble physical acoustics*".

- The **citation** for the Institute of Physics Paterson medal (2006) describes "*a world leader in four fields*".

- The **citation** for the Royal Society's Clifford Paterson Medal (2018), with the citation '*for translation of his fundamental research into acoustics and its application in many areas including anti-microbial resistance, mine detection, foetal scanning, catastrophe relief, climate change and marine life*'.

LEADERSHIP (ADMINISTRATIVE)

- I led the REF2014 bid for Southampton's entry into General Engineering, in which we entered 200 FTE academics (https://tinyurl.com/h7opauq).
- My record of 10 years of inventing with my own IPR strategic funded my research team for the last 10 years, and has just led to the formation of a new UK company (Sloan Water Technology Ltd.) by attracting Sloan Global Holdings to invest in Europe for the first time. This new company is based entirely on my patents.
- From an initial £10k stake, in under 2 years I led NAMRIP to win £7M research funds that would not have otherwise occurred, plus over £15M of funds for collaborations of which NAMRIP was a key organization. NAMRIP formed the basis of 2 spinouts (by other PIs) plus >6 licences, 4 trademarks, 5 patents granted and 11 patents pending. In NAMRIP I funded over 30 new collaborations, led mentoring programmes that transitioned 12 Early Career Researchers into PIs, and devised Public Engagement and

Public Policy programmes (http://tinyurl.com/h5f8k9b). In 2016 I globalized the network to form Global-NAMRIP (https://tinyurl.com/gm4t7bq).

7. Publications

PATENTS GRANTED SINCE 2015

- **Leighton TG** *et al*. (2018) EU divisional patent from European patent application 15196928.4.
- **Leighton TG** *et al*. (2018) Chinese Patent CN107835720A (published on 23/03/2018).
- **Leighton TG** *et al*. (2017) UK Patent (United Kingdom Patent Number GB2538276) from UK Patent Appl. GB1508167.2.
- **Leighton TG** *et al*. (2017) Japanese Patent #6134138 from Application JP 2012-526053.
- **Leighton TG** *et al*. (2016) European Patent # EP 2470310 from Application 10748081.6
- **Leighton TG** *et al*. (2016) German Patent # 602010029942-2 from Application 10748081.6
- **Leighton TG** *et al*. (2016) The Netherlands Patent Number 2470310 from Application No. 10748081.6
- **Leighton TG** *et al*. (2016) UK Patent Number 2470310 from Application No. 10748081.6
- **Leighton TG** *et al*. (2016) French Patent Number 2470310 from Application No. 10748081.6
- **Leighton TG** *et al*. (2016) Italian Patent Number 2470310 from Application No. 10748081.6
- **Leighton TG** *et al*. (2016) Chinese Pat. # 2150243 from Application CN 201080045751.5.
- **Leighton TG** *et al*. (2015) Russian Pat. # 2565705 from Application RU 2012111316.

INTERNATIONAL & NATIONAL GUIDELINES (a full list of ~400 publications is available at http://tinyurl.com/gnr5ep7)

- **Bryant G,** *et al.* (2015) Minimise transmission risk of CJD and vCJD in healthcare settings. Report on the Prevention of CJD and vCJD by Advisory Committee on Dangerous Pathogens' Transmission Spongiform Encephalopathy (ACDP TSE) Subgroup. Published as part of the Creutzfeldt-Jakob disease (CJD): guidance, data and analysis reports by the UK Government Department of Health (22 October2015). Crown Copyright 2015. http://tinyurl.com/zrjxg8j
- **Hannis S,** *et al.* (2015) Review of Offshore Monitoring for CCS Projects, IEAGHG Technical Report 2015-02 (July 2015) Copyright 2016 IEAGHG. http://tinyurl.com/judwf5h
- **Barnett S,** *et al.* (1998). *World Federation for Ultrasound In Medicine and Biology, Task Group Report for Safety Committee of the* WFUMB: Conclusions and recommendations on thermal and non-thermal mechanisms for biological effects of ultrasound. *Ultrasound in Medicine and Biology*, **24**, Supplement 1 (59 pages). http://tinyurl.com/hmvncz8

JOURNAL PAPERS: a full list of ~400 publications is available at http://tinyurl.com/gnr5ep7
TV, VIDEO & RADIO: a full list wih download links is at https://tinyurl.com/yatoybhf

8. Outreach statement

The website https://tinyurl.com/yatoybhf contains a listing of my TV and Radio appearances, with downloads available.

My first outreach was giving the Opening invited lecture to the 1992 Women in Physics Conference (Cambridge UK).

Since then I founded and led NAMRIP's Public Engagement (https://tinyurl.com/hczug24) and Public Policy (https://tinyurl.com/jgso9h6) programmes, and won 2 Roadshow awards for Public Engagement. My invention, "The most dangerous game in the world", was mentioned by Steve Brine MP the Under-Secretary of State for Health on 16 November 2017 (https://tinyurl.com/yaon9bm8 and https://tinyurl.com/y9bu6s8f).

Example activities include talking to the public about AMR in June 2016 at the Cheltenham Science Festival (http://tinyurl.com/zwwyq3r).

I have online material, one online lecture (http://tinyurl.com/ot5pffk) having 2800 views. StarStream™ alone engendered public comments, for top national science TV shows in **Italy** (4898 Youtube hits, including '*Bellissimo video, Grazie*'), **Germany** (271 Youtube hits - http://tinyurl.com/jmm84yn), and the **UK** (301 Youtube hits incl. '*She is right - that cleaning machine is magic!*' - http://tinyurl.com/jf2c6j2). Videos were posted by the **Royal Society** (4825 Youtube hits, incl. '*such a great idea!!*' - http://tinyurl.com/jatedbb) and **Ultrawave Ltd**. websites (6306 Youtube hits - http://tinyurl.com/zya7wpe).

9. Public service includes

• Founding Chairman, Global Network on Antimicrobial Resistance and Infection Prevention (Global-NAMRIP) https://tinyurl.com/ycdkh92u • Founding Chairman, Network on Antimicrobial Resistance and Infection Prevention (NAMRA; http://tinyurl.com/h5f8k9b); • Founding Chairman, UK Health Effects of Airborne Ultrasound (HEFUA, http://tinyurl.com/zrud6nw); • Government of the United Kingdom's Working Group of the Advisory Committee on Dangerous Pathogens Transmissible Spongiform Encephalopathies Sub Group; • Scientific Expert Group of the International Commission on Non-Ionizing Radiation Protection; • Defence Scientific Advisory Council (DSAC), Ministry of Defence (MoD); • World Federation of Ultrasound in Medicine and Biology Safety Work Group; • Ministry of Defence Brains Trust, under MoD Science and Technology Rapid Assistance to Operations (STRATOS) programme; • Maritime Mine Countermeasures Workgroup, DSAC, MoD; • Scoping Group on Ultrasound and Infrasound Safety, Health Protection Agency; • Work Group 22 of Accredited Standards Committee S1 of Acoustical Society of America; • Member, Panels 1 and 6 of Royal Academy of Engineering Membership Committees; • Stage 1 Reviewer, Postdoctoral Fellowships, Royal Academy of Engineering; • Member, Royal Society Fellowship Sectional Committee 4; • Member of the Royal Society's Wolfson Research Merit Awards Selection Committee 4; • Member of the Royal Society's Newton Advanced Fellowship assessment panel; • Member, Ingenious Panel Royal Academy of Engineering; • Past Council member and Trustee, Institute of Acoustics; • numerous technical and administrative (e.g. research coordination) committees for ~5 professional and learned scientific organizations; • 18 times serving as organizer and Chair of a Conference (plus numerous occasion serving as a member of the organizing or scientific advisory committee for a conference); • Member, Editorial Board of the Proceedings of the Royal Society A; • Chair, Sectional Committee 4 for Fellowship of the Royal Society.

ORCHESTRA CHAIRMANSHIP (CONCERTS FOR CHARITY)

•Chairman, Marchwood Orchestra; Founding Chairman, Solent Concert Orchestra

10.Mentoring

MAJOR CONTRIBUTIONS TO EARLY CAREER RESEARCHER (ECRs) PROGRAMMES

I have encouraged for many years, for example in the ECR programme he set up in NAMRIP, mentoring postdocs and PhD students from across all disciplines in the university into a tight-knit cohort of mutually supportive PIs. This was so successful that in only 2 years it resulted in 13 postdocs transitioned to Principal Investigators, running their own budgets and starting their own small research teams in NAMRIP. Both NAMRIP & HEFUA steering committees include ECRs at my instigation. The NAMRIP ERC programme was the third such programme that I set up to inspire and support the next generation of researchers and research leaders, the previous two being so successful that, after a few years, the first researchers I mentored on those programmes took over the running of them. In 2018 the Academy of Medical Sciences asked me to write a work/life balance item they published for UK ECRs.

OWN PhD STUDENTS

My own 26 past PhDs now mainly have significant careers in industry, one being a home-makers, the rest are postdocs in universities:

	2010 – Mantouka A	2005 - Jamaluddin AR	2002 - Richards SD
	2010 - Coles D	2005 - Meers SD	2000 - Hubbuck ER
2018 – Zhu M (minor corrections)	2009 - Finfer DC	2004 - Clarke JWLC	1999 - Lopes DMB
2017 – Banda N	2008 - Fedele F	2004 - Gutowski M	1999 - Evans RCP
2015 – Berges B	2007 - Vian C	2004 - Robb GBN	1997 - Radcliffe SA
2012 - Chua GH	2007 - Hirsimaki HM	2003 - Watson YE	1995 - Ramble DG
2011 – Saunders K	2005 - Offin DG	2003 - Power JF	1994 - Phelps AD