RESEARCH COLLOQUIUM

Communications and Radio Science for a Smarter World

March 8-9 2017

Royal Irish Academy
19 Dawson Street
Dublin 2

Royal Irish Academy Committee on Engineering and Computer Sciences

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Acadamh Ríoga na hÉireann
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Research Colloquium on

"Radio Science and Communications for a Smarter World"

Academy House Dawson Street, Dublin 2
8th and 9th March 2017

Wednesday 8th March 2017:

17:30	Registration desk open
18:00 – 19:15	**Wine Reception for Registered Delegates**, at Academy House MC – *Dr. Máirtín O'Droma, University of Limerick.* **Welcome Addresses:** *Prof. Alan Smeaton Chair of the Royal Irish Academy Committee on Engineering and Computer Sciences* **Invited Speakers:** *Mr. Joe Lynch, Test and Trial Ireland (COMREG).* "Radio Spectrum Management Strategy 2016-2018" *Dr Peter Cochrane OBE, BSc, MSc, PhD, DSc, CGIA, FREng, FRSA, FIEE, FIEEE.* "Infinite Capacity Wireless Sans Channels and Bands"
18:00 - 19:15	**Poster Session** (This session continues during coffee breaks and lunch on March 9th)

Thursday 9th March 2017:

08:45 – 09:15	**Registration**
09:15 – 09:30	**Colloquium Opening** *Dr. Ronan Farrell, Maynooth University* *Chair, Technical Programme Committee.* **Welcome**
09:30 – 16:55	**Colloquium Oral and Poster Sessions (continued)**

Organisational Committee:

Prof. M. Ammann	Dr. R. Farrell	Dr. K. McCarthy
Prof. T. Brazil	Prof. V. Fusco	Dr. R. O'Connor
Dr. C. Brennan*	Dr. J. King	Dr M. O'Droma

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Technical Programme Committee:

Prof. M. Ammann	Dr. C. Browning	Prof. V. Fusco	Dr. P. O'Leary
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Prof. T. Brazil	Dr. R. Conway	Dr. J. King	Dr. P. Varahram
Dr. N. Buchanan	Dr. J. Dooley	Dr. K. McCarthy	Dr. J. Walker
Dr. C. Brennan	Dr. R. Farrell*	Dr M. O'Droma	Dr. A. Zhu

* Chair

Colloquium Proceedings CD is available from RIA, Academy House, Dawson St., Dublin 2. ISBN: XXXXX

Thursday 9th March 2017:

Colloquium Oral Sessions:

Session 1: Wireless Systems and Subsystems I

Chair: Dr. Justin King, University College Dublin

09.30 – 10:00 LTE cellular wireless communication serving public safety applications
Invited Speaker – *John Doyle, Benetel.*

10:00 – 10:20 A high power efficiency 2x11-bit all-digital RFDAC
F. Zhang, P. Chen, R. Staszewski, A. Zhu, University College Dublin.

10:20 – 10:40 Surface treatment of 3D metal printed microwave components
D. Shamvedi, O. McCarthy, E. O'Donoghue, P. O'Leary, R. Raghavendra, Waterford Institute of Technology.

10:40 – 11:00 Stability analysis of DC-DC converters used in visible light communication systems
B. Hayes[1] and M. Condon[2]
1 University College Dublin, 2 Dublin City University.

11:00 – 11:30 **Tea/Coffee and Poster Session continued.**

Session 2: Wireless Innovation, Development and Application Trends

Chair: Dr. Máirtin O'Droma, University of Limerick

11:30 – 12:00 The I in IoT
Invited Speaker – *Mark Kelly, Intel.*

12:00 – 12:20 Designing an IoT wireless-based air quality index monitoring and publishing system
I. Ganchev[1,2], Z. Ji[1,3], M. O'Droma[1],
1 University of Limerick, 2Plovdiv University, 3 North China University of Science and Technology.

12:20 – 12:40 Frequency interleaved modulators to support channel bonding in satellite communications
P. Ramabadran, J. Dooley and R. Farrell, Maynooth University.

12:40 – 13:00 Fixed-wireless convergence in a passive optical network for 5G fronthaul

C. Browning[1], A. Farhang[2], A Saljoghei[1], N. Marchetti[2], V. Vujicic[1], L. E. Doyle[2], L. P. Barry[1]
1 Dublin City University, 2 CONNECT Research Centre Trinity College Dublin.

Thursday 9th March 2017 (contd):

13:00 – 14:00 **Lunch**

Session 3: Antennas and Propagation

Chair: Prof. Vince Fusco, Queen's University Belfast

14:00 – 14:30 Impulse Radio UWB – Adding value and security to the IoT
Invited Speaker - *Mickael Viot, Decawave.*

14:30 – 14:50 Spatial mapping of EM fields within an X-band waveguide for plane-wave illumination
P. Bradley[1], C. Brennan[1], M. Torrico[2] and Y. Hao[2]
1 Dublin City University, 2 Queen Mary University London.

14:50 – 15:10 433 MHz antenna transmission line model including human body effects
J. L. Buckley[1], B. O Flynn[1], A. Di Serio[1], K. G. McCarthy[2],
1 Tyndall National Institute, 2 University College Cork.

15:10 – 15:30 Directional modulation without an antenna array – wireless privacy for internet of things
A. Narbudowicz and M. J. Ammann, Dublin Institute of Technology.

15:30 – 15:50 Approximation-free mutual coupling evaluation approach for MIMO antennas
G. Wolosinski[1], V. Fusco[1] and P. Rulikowski[2]
1 Queen's University Belfast, 2 Nokia Bell Labs.

15:50 – 16:20 **Tea/Coffee and Poster Session (contd.)**

Session 4: Wireless Systems and Subsystems II

Chair: Dr. Kevin McCarthy University College Cork

16:20 – 16:40 A 2.0-2.5 GHz frequency-selectable oscillator for digital pre-distortion model identification
K. McGrath and A. Zhu, University College Dublin.

16:40 – 17:00 A low complexity NARX structure using indirect learning architecture for digital pre-distortion
P. Varahram, J. Dooley, Z. Wang, K. Finnerty and R. Farrell, Maynooth University.

17:00 – 17:20 Extraction of extrinsic FET parameters at multiple bias points
C. Wilson, J. King and T. Brazil, University College Dublin.

17:20 **Prize ceremony and conclusion of colloquium**

Colloquium Poster Session:

Wednesday 8th March (18-00 to 19-15)
and
Thursday 9th March (coffee and lunch breaks)

Energy efficient heterogeneous networks: A case study *J. Kulangara, A Rose K.M., R George and M. Reghunath, SFO Technologies Private Ltd.*

Nonlinearity-induced spurious tones and noise in fractional-N frequency synthesizers
M. P. Kennedy[1,2], H. M[1,2], D. Mai[1,2],
1 University College Cork, 2 Tyndall National Institute.

Analysis of full wave 2D to 3D propagation models and ray tracing for indoor environments
I. Kavanagh and C. Brennan, Dublin City University.

Adaptive self-interference cancellation for 5G full-duplex wireless transceivers
B. Keogh[1,2], Y. Wei[1], N. Kelly[1], P. Farell[2], A. Zhu[1]
1 University College Dublin, 2 Institute of Technology Tallaght.

Analysis of the effect of building material on propagation prediction in urban environments.
S. Hussain and C. Brennan, Dublin City University.

Study on composite piezoelectric material position effects in passive wireless MEMS based SAW sensor for greenhouse gases
S. Valluru, Dublin City University.