

Gdansk, Poland, 4-6 September 2019

SUBJECT | Minutes of the 11th Management Committee Meeting of COST Action CA15104 "Inclusive Radio Communication Networks for 5G and beyond (IRACON)"

WEDNESDAY, 4 SEPTEMBER 2019

Welcome to participants

Prof. Claude Oestges, Chair of the Action, opened the meeting on Sep 4th, 2019, at 9.00 am. The participants were welcomed by the Local Organizer, Dr. Slawomir Ambroziak, Gdańsk University of Technology. Information about the local arrangements were provided to the audience.

The Chair acknowledged the fulfilment of the quorum, i.e. at least two thirds of the COST countries participating in the Action are represented at the 11th MCM.

1. Adoption of agenda

The Chair presented the agenda of the 11th MCM, which had been previously circulated online. The Agenda was adopted without modifications.

The Chair took the opportunity to remind all participants to sign the official COST Attendance List for every day of attendance and to sign only once the attendance list of every WG/EWG session attended. No reimbursement of travel expenses (for those entitled to) will be processed if the attendance lists are not duly signed.

Finally, the attendees were informed that the Newsletter Meeting, involving the Members of the steering committee, will take place on Thursday at 5:45 pm in Room 231.

2. Approval of minutes and matters arising from last meeting (MCM10 - Oulu, Finland)

With no further comments from the attendees, the minutes of the 10th MC Meeting, previously circulated online, were officially approved.

3. Status of the Action

The Chair moved on to update the audience on the overall status of the Action. Since the last meeting in Oulu, no new Partners have joined IRACON. The University of Canterbury from New Zealand had been previously approved as

Partner, but they have never participated in the Action’s event, therefore their participation is still to be finalised.

Here below the main figures presented:

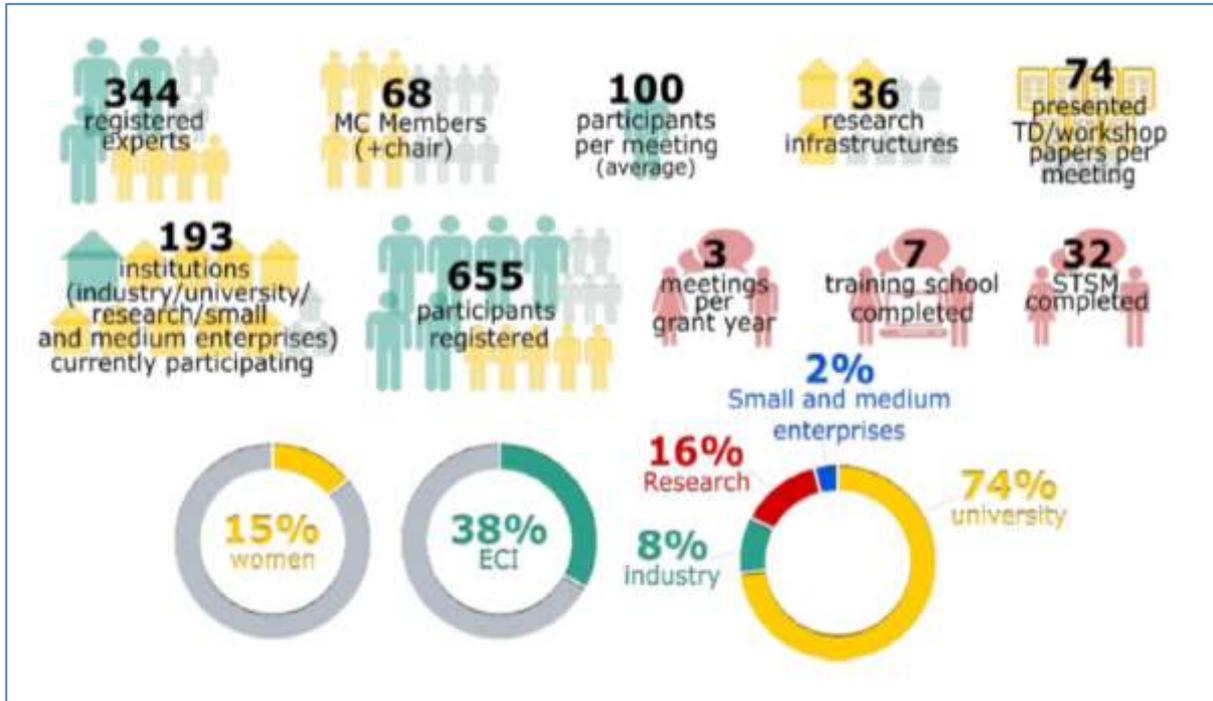
Partners

- Number of signatory countries: 35 (out of 36)
- Number of MC Members: 66 (+ Chair)
- Near Neighbour Country Institutions: 4 approved

National Research Tomsk Polytechnic University	Russian Federation
YK State University of Grodno	Belarus
RUDN University	Russian Federation
University of Prishtina	Kosovo

- International Partner Country Institutions: **13** approved and activated, **1** conditionally approved. Indeed, the University of Canterbury, New Zealand, is not yet fully approved because they have never attended a meeting, which was the condition to finalise their approval.

Beijing Jiaotong University	China
Tokyo Institute of Technology	Japan
Comsearch	United States of America
NIST	United States of America
Samsung Electronics Co.	Korea, Republic of
Japan Advanced Institute of Science and Technology	Japan
Motorola Mobility LLC	United States of America
Universidad Icesi	Colombia
Niigata University	Japan
Northeastern University	United States of America
CSIR	South Africa
Huawei Device Company	China
ETS	Canada
University of Canterbury	New Zealand



Important Reminders: Deadlines and Procedures

The Chair went on to remind the participants about some important procedures and internal rules of the Action, such as: TD submission, meeting registration, reimbursements and acknowledgments.

▪ TD submission

The Chair reminded everyone to request TD numbers and submit TDs on time!

- ✓ Request a TD number (usually **20 days** before the meeting)
- ✓ Send to the secretary a full TD (**10 days** before the meeting), using the cover page available on the website

It's important to meet the deadlines, as these are set to enable the StC to prepare the meeting schedule.

▪ Meeting registration: two actions are required

- ✓ Register on IRACON website (**20 days** before the meeting)
- ✓ Accept the e-cost invitation

▪ Reimbursement (for those entitled to)

- ✓ Accept the e-cost invitation (before the meeting)
- ✓ Fill the e-cost and submit the claim (after the meeting)



Reimbursement claims must be submitted on time, the risk being that everyone's reimbursement process is slowed down.

The reimbursement procedure MUST take place on the e-COST.

Those entitled to a reimbursement should always keep their original supporting documents (tickets, receipts, invoices), even after uploading the claim on the e-COST.

If you cannot attend and wish to be replaced by an eligible substitute:

- ✓ Send a request to the Chair and GH (cc: secretary) at least **20 days** prior to the event to enable the reimbursement of your official substitute.

Important Reminders: e-Mailing and Acknowledgment

- Usage of global reflector
 - ✓ The global reflector (all_ca15104@iracon.org, moderated) should not be used to advertise events (outside those of the Action itself)
 - ✓ If you need to circulate a message among the IRACON members, the correct procedure is to ask Alice (a.baldini@unibo.it) to include your announcement on the IRACON website, in the "News" section
- Furthermore, WG reflectors have been created to circulate messages that are specifically related to WG issues
- COST CA15104 IRACON should be acknowledged on all joint publications, as follows:
 - ✓ *This work was carried out in the framework of COST Action CA15104 IRACON*
 - ✓ *The authors acknowledge the fruitful discussions in COST Action CA15104 IRACON*

The Chair highlighted that it is very important to acknowledge the Action, because it is one of the few metrics to show that the Action is doing well.

After reviewing the main procedures, the Chair briefly summarised the most recent event that took place within the Action, namely:

May 2019

10th MCM (Oulu, 27-29 May 2019)
Organized by Oulu University and Keysight

65 TDs

3 invited speakers

93 participants



4. Review of action deliverables

The Chair updated the participants on the status of the technical deliverables (in green the deliverables already provided).

- **Deliverable 1** (M14, **May 2017**): Working Groups first year term annual report summarising the achievements of every WG → **all WGs**
- **Deliverable 2** (M20, **November 2017**): Overview of IRACON Reference Scenarios and assessment of 5G radio access techniques through experimental platforms → **WG3, EWG-RA**
- **Deliverable 3** (M24, **March 2018**): Submission to international bodies of contributions about concerted 5G radio channel models → **WG1**
- **Deliverable 4** (M24, **March 2018**): Collaborative white paper on new localization techniques suitable for 5G and the Internet of Things → **EWG-LT+IoT**
- **Deliverable 5** (M26, **May 2018**): Working Groups second year term annual report summarising the achievements of every WG → **all WGs**
- **Deliverable 6** (M36, **March 2019**): Collaborative white paper on future architecture and protocols for the Internet of Things → **EWG-IoT**
- **Deliverable 7** (M38, **May 2019**) : Working Group third year term annual report summarising the achievements of every WG → **all WGs**
- **Deliverable 8** (M42, **September 2019**): Technical inputs and liaison statements to Standardisation Groups on metrics for Over the Air (OTA) testing → **EWG-OTA**
- **Deliverable 9** (M42, **September 2019**): IRACON concerted radio channel models for 5G and beyond (draft book chapter) → **WG1**
- **Deliverable 10** (M50, **May 2020**): Working Group final report summarizing the achievements of every WG in the overall Action (draft book) → **all WGs**

Prof. Oestges focused particularly on the timeline of Deliverables 8 and 9:

Edition

- ✓ WG chairs are the editors

Content

- ✓ Defined by the WG, based on the draft chapter

Schedule

- ✓ Draft version by Sep 15, 2019
- ✓ Delivery by Sep 30, 2019

5. Final Book

Afterwards, the Chair provided an update on the preparation of the Action's final book, which is intended as a report on the TDs presented throughout the 4 years.

He emphasised that the graphs in the book must be copyright free and that the copyright applies to the pictures, not the contents.

He then reviewed the **Timeline** for the book preparation and stated that we are currently on track to meet the deadline:

- During Cartagena meeting, each WG discusses about a list of sections
- After Cartagena meeting, the WG chairs finalize the discussion and propose the list of sections to the Chair
- Integration of all sections into a set of coherent chapters by the BEC
- The ToC is frozen at Podgorica meeting (40 pages per chapter)
- Chapter and section editors are identified at Podgorica meeting
- IRACON Chair must search for publisher between MCM8 and MCM9
- The first draft of the book is ready by May 2019
- The second draft is ready by Sep 2019
- The graphs are made copy-right free
- The TDs are mapped to papers when existing
- The final draft is ready by Jan 2020 (the book will **not** include TDs from the final meeting)

The **Book Editors** are:

- Claude Oestges and François Quitin

Prof. Oestges reviewed the Table of Contents:

1. Introduction

2. Radio propagation modelling methods and tools

- 2.1 5G and beyond propagation environnements
- 2.2 Channel model classification
- 2.3 Algorithms for estimation of radio channel parameters

3. IRACON measurements and channels for 5G and beyond communications

- 3.1 Measurement scenarios
- 3.2 Millimetre wave and THz channels
- 3.3 MIMO and massive MIMO channels
- 3.4 Fast time-varying channels
- 3.5 Electric properties of materials for 5G channel simulators

4. Over-the-Air testing for 5G

- 4.1 Field emulation for electrically large test objects
- 4.2 Emulation of millimetre wave channels
- 4.3 Emulation techniques for testing hardware internals



5. Coding and processing for advanced wireless networks

- 5.1 Advanced waveforms, coding and signal processing
- 5.2 Distributed and cooperative PHY processing in wireless networks
- 5.3 Massive MIMO
- 5.4 Implementation and HW driven solutions and full duplex communications

6. 5G and beyond networks

- 6.1 Wireless connectivity
- 6.2 Spectrum management and sharing
- 6.3 Scheduling and RRM
- 6.4 5G radio access platforms
- 6.5 HetNet and UDN
- 6.6 CRAN
- 6.7 SDN and NFV
- 6.8 UAVs
- 6.9. Application domains and solutions

7. IoT protocols, architectures and applications

- 7.1 Low power Wide Area Networks
- 7.2 Routing and MAC protocols for IoT
- 7.3 Vehicular communications
- 7.4 Energy efficient/constrained solutions for IoT
- 7.5 Software Defined Networking and Virtualization for IoT
- 7.6 Special applications of IoT

8. IoT for healthcare applications

- 8.1 Nano-communications
- 8.2 Wearable and implantable IoT-Health Technology
- 8.3 IoT-Health Networking and Applications

9. Localization and tracking

- 9.1 Measurement acquisition, modeling, and performance limits
- 9.2 Positioning methods, data fusion and tracking
- 9.3 Channel modeling and multipath exploitation
- 9.4 System study and system-level performance analysis
- 9.5 Testbed and prototyping activities

10. Future trends in communications, networking and beyond



6. Report from the Grant Holder

Prof. Roberto Verdone, the Grant Holder of the Action, showed the **Work and Budget Plan for Year 4**:

Networking Tool	Quantity/Description	Budget
Meetings	3 MCMs	111 550.00 EUR
Training Schools	3 TSs	19 000.00 EUR
STSMs	5 STSMs	6 000.00 EUR
ITC Conference Grants	2 conference grants	600.00 EUR
Other Expenses Related to Scientific Activities	Bank fees	1 546.00 EUR
Total Science Expenditure		138 696.00 EUR
Financial and Scientific Administration and Coordination (MAX. 15%)	15 %	20 804.40 EUR
Total Grant		159 500.40 EUR

He then presented the current **Status of expenditures**:

Steps	Budget
Total Grant	159 500.40 EUR
1 st Instalment received (Aug '19) → 50%	79 750.20 EUR
Budget for Science	69 348.00 EUR
Meetings (1, Oulu - reimbursed)	51 316.33 EUR
Training Schools (0)	0.00 EUR
STSMs (5 - partially reimbursed)	5 800.00 EUR
ITC Conference Grants (1)	600.00 EUR
Bank fees / OERSA (approx.)	384.50 EUR
Total spent	58 100.83 EUR
Balance	11 247.17 EUR

Prof. Verdone explained that the 11,247.17 EUR left from the 1st tranche will not be enough to cover the reimbursements from Gdansk. In order to request and receive a 2nd tranche the Action must demonstrate to COST that all the money from the 1st tranche was spent. Therefore, the eligible participants are encouraged to submit their claims as soon as possible, so as to show COST that there are already many pending payments and thus a need for the next instalment.

He underlined that there is no more budget available for STSMs and ITC-CGs.

Finally, he informed the attendees that publishing the final book will likely require 2,3K EUR beyond the 10K EUR already allocated. This amount might be taken from the budget collected by EURACON for IRACON.



7. Report from Training Manager (STSMs, Training Schools and Tutorials)

The Training Manager, Prof. Laurent Clavier, reviewed all the Training Schools that have taken and will take place during the Action, namely:

2019/2020

- 10- Winter School on **New radio access techniques enabling advanced video applications in 5G**, 20-22 November 2019, Madrid, Spain
- 9- Training School on **Network Models, Architectures and Applications for 5G** – 7-11 October 2019, RUDN University, Moscow, Russia
- 8- WIBEC/COST-IRACON Training Workshop, 4 October 2019, Valencia, Spain

2018/2019

- 7- Training School on **Machine Learning and Wireless Communication** – 8-11 Apr. 2019 - Barcelona, CTTC
- 6- Joint Training Workshop IRACON-WaveComBE on **Milimeter Wave Indoor Channels**, Jan. 2019.
- 5- Winter School on Information **Theory and Signal Processing for Internet of Things** – 18-22 Nov. 2018, Lyon, France.

2017/2018

- 4- IRACON/Met5G Training School on **interference in 5G** – April 16-17, 2018 Guildford, Surrey, UK.
- 3- VTS PT Chapter/COST-IRACON Joint Winter School on **Beyond 5G Networks operating in the Millimetre Wavebands enabled by Joint Analogue-digital Signal Processing** – March 5-9, 2018 Lisbon, Portugal
- 2- ESoA/COST-IRACON **Joint Training School on Large Scale Radio Propagation** – June 12-16, 2017 Louvain-La-Neuve, Belgium

2016/2017

- 1- WIBEC/COST-IRACON Joint Training School on **Antennas and Propagation Modeling for Body Environment Communications** – May 1-3, 2017 Dresden, Germany



Prof. Clavier explained that the next training school (or Training Workshop) might be in Valencia, Spain, on October 4th, and co-organised by IRACON and WIBEC ITN. However, we are waiting for an update from Prof. Narcis Cardona about its feasibility. If it is organised, there will be an open call to assign a few grants, on a first arrived first served basis.

He then focused on the last Training School, which will be held in Madrid, Spain, on 20-22 November 2019:



Organizers

Ana Garcia Armada, Universidad Carlos III de Madrid, Spain
Fernando J. Velez, Instituto de Telecomunicações/Universidade da Beira Interior, Portugal
Alvaro Villegas, Nokia Bell Labs, Spain

Description

Recent advances in radio access (signal processing, modulation, random access schemes and resource management); Business aspects, cost/revenue trade-off, public policies for spectrum sharing and new frequencies; Industrial experience, IPR knowledge of the Spanish patent office, "hands-on".

- The fact that video is (and will continue) dominating the mobile traffic is one of the drivers for the deployment of 5G.
- The new radio access techniques need to be able to provide the quality of service and experience that the new applications are demanding.
- In this Winter School we will have the possibility to learn from experts from both domains: the radio access and the video applications.
- Discussions to find out what is missing and where to orient the students' research will be one of the main contributions of the training.
- Business aspects, cost/revenue trade-off, public policies for spectrum sharing and new frequencies, entrepreneurship and IPR protection will also be central parts of the training.



- The event also includes training on research, as it foresees a poster session that will allow the students to share their recent findings and ideas with their colleagues and tutors, who will give feedback and suggestions.
- Academic vision will be complemented by industrial experience, the IPR knowledge of the Spanish patent office and the "hands-on" part of the training.

Programme

20 November

9:00 Registration and Welcome

9:30 Seminar on patents and IPR – Juan Manuel Vázquez Burgos, OEPM (Spanish Patent Office)

13:00 Lunch

14:30 Visit to Nokia Bell Labs / Talk on AR/VR in 5G by Bell Labs expert Alvaro Villegas

16:30 Visit to Telefónica / Talk on Radio access by Telefónica expert F. Javier Lorca

21 November

9:30 Multicarrier modulations for 5G and beyond

10:30 Massive MIMO in 5G

11:30 Cell Free Massive MIMO

12:30 Physical Layer Aspects of Ultra-Reliable Low-Latency Communication

13:30 Lunch

15:00 Visit to labs and demos

16:00 Poster session

22 November

9:30 IoT architectures using CoAP

10:30 Blockchain for Communications

11:30 About video QoS

12:30 Are Drones the killer application for taking 5G to new heights?

13:30 Lunch

15:00 Entrepreneurship - case study

18:00 Closing remarks

Confirmed speakers

- Juan Manuel Vázquez Burgos, OEPM (Spanish Patent Office)
- Alvaro Villegas, Nokia Bell Labs Spain
- F. Javier Lorca, Telefónica
- Theodoros Tsiftsis, Jinan University, China (Sponsored by IEEE VTS)
- Jelena Misić, Ryerson University, Canada (Sponsored by IEEE VTS)
- Vojislav Misić, Ryerson University, Canada
- Luis Bellido, UPM, Spain
- L Miguel Campos, PDMF, Portugal
- Alben D. Mihovska, Aarhus University, Denmark
- Peter Lindgren, Aarhus University, Denmark
- Ana García Armada, Universidad Carlos III de Madrid, Spain



Finally, Prof. Clavier reviewed the list of STSMs that have been organised throughout the Action:

STSMs for GP1

10 accepted

Spain (x2), Austria, Denmark (x2), Croatia, Belgium, Italy (x3), Germany (x2), France (x3), Finland (x2), Portugal, Bosnia and Herzegovina (x2)

1. Multi-bands MIMO dual-Pol measurements and characterization of Radio Propagation for future 5G and B5G Wireless systems
2. Spatial Consistency in 5G Radio Channel Propagation mm-wave Spectrum
3. Characterization and Modeling of the MIMO Radio channel in the W-band
4. Concealed, Chassis Integrated, Pattern Reconfigurable, Automotive Antenna
5. Over-the-air performance evaluation of massive MIMO antenna systems in anechoic chambers
6. Implementation and measurement of 5G waveform candidate using OpenAirInterface
7. Introducing Multiple UAV Trajectories in UAV-Aided B5G Networks
8. Impact of Radio Channel on the Performance of ALOHA-based Medium Access Control Schemes
9. Experimental Characterization of Joint Scheduling and Routing algorithm over 6TiSCH
10. Performance Evaluation of MCF (minimum cost forwarding) and SRMCF (source routing MCF) routing protocols over 6TiSCH (IPv6 over the TSCH mode of IEEE 802.15.4e)

STSMs for GP2

11 accepted – 2 rejected – 1 cancelled

Sweden (x5), Belgium, Austria (x2), UK, Finland, Spain (x3), Poland (x2), Portugal (x3), Italy, Russia, France, Germany

1. Measurement and Characterisation of a Real-Time Channel Emulator based on a Software Defined Radio
2. Characterization and design of mm-wave antennas for 5G
3. Polarised Off-body Channel Measurements with Dynamic User
4. Simulations of the radio channel in off-body communications in a passenger ferry environment
5. 5th Generation (5G) Communications: Parameterizing COST2100 at 60 GHz for the establishment of simplified user scheduling for Massive MIMO
6. Full-Duplex device-to-Device Communications
7. Implementation of Low-complexity Hybrid Analogue-digital Solutions in CAP-MIMO
8. Power-efficient and reliable mm-wave communications in dynamic environments
9. Design RF devices in millimetres with glide-symmetry structures
10. Tactile internet enabled Drone Control over LTE for Ultra-Dense Cloud Drone Networks
11. Elaboration and description of multipath propagation for mmW



STSMs for GP3

11 accepted – 5 rejected

Denmark, Belgium (x3), Spain (x3), Croatia, Serbie, France (x2), Poland (x2), Portugal (x4), Italy, **Russia (x3), USA**

1. Air-to-ground channel characterization at mmWave frequencies
2. Simulation of polarised off-body channels with dynamic users
3. New channel estimation algorithms at the physical level to improve the performance of future communications systems relying on the use of a new waveform.
4. Utilization of Advanced RFID Physical Layer Modeling for the Design of Advanced Reception/Transmission Algorithms
5. Modulation based Simultaneous Wireless Information and Power Transfer
6. Experimental validation of Physical Layer Security using SISO and MISO configurations.
7. Implementation of algorithms or designs in Software Defined Radio (SDR) nodes, in order to evaluate diverse communication scenarios using FIT/CortexLab
8. **SLA-based network slicing analytical modelling**
9. **Analytical modelling of the mobile computing offloading**
10. **Robust Bayesian Parametric/Nonparametric Statistical Inference for Indoor Localization, Tracking and Navigation**
11. Communication interfaces for medical chips in patients bodies suitable for early detection of infections

STSMs for GP4

5 accepted – 3 rejected

Austria (x2), France (x2), Norway, Spain, Sweden, Ireland, Bosnia and Herzegovina, Slovenia

1. **New Measures of Service Reliability for Shared Mobile Networks**
2. **Experimental evaluation of joint routing and scheduling algorithm in 6TISCH WSN networks**
3. **Exploitation of 3D deterministic channel models for realistic hybrid 5G and GNSS positioning simulations d Navigation**
4. User Separability in Distributed Massive MIMO Systems
5. Millimetre Wave Over-the-Air Testing with Measured Channels

To summarise, these are the main figures of IRACON's STSMs:

- A total of **37 STSMs** were held;
- STSMs were carried out mainly (if not all) by **ECIs** or **ESRs** (Early Stage Researchers);
- **19 countries** were involved at least once (6 ITC, 1 NNC, 1 non-COST).

The Training Manager underlined how this is a very good result overall, facilitated also by a good working tool.



8. Report from Dissemination Manager

The Dissemination Manager, Prof. Luis Correia, reviewed the Dissemination Actions that took place, namely:

IRACON SPECIAL SESSIONS AND WORKSHOPS

EuCAP 2020 Special Sessions (will take place after the end of IRACON)

- AMTA/IRACON Session: Over-The-Air Testing of 5G Radios
- IET/IRACON Session: Propagation Measurements and Modelling for 5G and Beyond
- IRACON Session: Spectrum Sharing: Challenges and Opportunities for 5G and Beyond

EuCAP 2020 Workshop

- COST Session CA15104 (IRACON): Measurements and Simulations in Channel Modelling in Wireless Body Area Networks

IEEE EUROCON 2019 Special Session (Novi Sad, Serbia, July 2019)

- Industrial Internet of Things (organized by Gordana Gardasevic)

SOCIAL MEDIA

- **Dissemination list for PhD training events**
- **Leaflet**
 - Goal: high-level introduction of the Action
 - Updated after each meeting
- **Newsletters**
 - All issues available at www.iracon.org under "Publications"
 - Next issue to be expected after this meeting
- **Blog**
 - To launch discussions and/or express views
- **Instagram, youtube, facebook, linkedin**
 - Send contributions to Alice

A SPECIAL ISSUE IN RADIO SCIENCE



IRACON FINAL WORKSHOP

The Dissemination Manager presented the Final Workshop that will be held during the 12th (and last) MC Meeting in Louvain-la-Neuve, Belgium, on 27 or 28 January 2020.

Final IRACON workshop in UCLouvain (BE) on Jan 27 or 28, 2020

- 8 IRACON invited speakers: to be proposed by each DWG/EWG (incl. Sub-EWG) after this meeting
 - ✓ Future challenges in the DWG/EWG topics (*what we didn't do*)
- 4 speakers corresponding to the 4 Verticals: names (from IRACON or not) to be proposed by WG for one or several Verticals (Health/Sport/Human – Transportation – Industrial Automation – Smart Environments)
 - ✓ Emerging challenges (*what we will do*)

→ 12 invited speakers in total

9. Presentation and Discussion of Technical Documents

The Chair informed the audience that a total of **55 TDs** will be presented during the Working Group meetings and shared the schedule:

	Wednesday				Thursday				Friday			
	Aud2	NE 230	NE 231	Room	Aud2	NE 230	NE 231	Room	Aud2	NE 230	NE 231	Room
Start time	9:00 - 10:45				9:00 - 10:45				9:00 - 10:45			
Hours												
Sessions	MC Plenary (Auditorium 2)				WG1	WG3		Groups	WG1	IoT (+1)		Groups
TD number or other					models	cellular RRM		Topic	measureme	IoT		Topic
TD number or other					13	5			33	23		
TD number or other					42	39			26	41		
TD number or other					8	50			38	DISC		
TD number or other	20	7			DISC	DISC						
TD number or other	DISC	DISC										
Coffee break	10:45-11:15				10:45-11:15				10:45-11:15			
	11:15 - 13:00				11:15 - 13:00				11:15 - 13:00			
Sessions	WG1	WG3	WG2	Groups	OTA (+WG1)	IoT	LT (+3)	Groups	MC Plenary (Auditorium 2)			
TD number or other	mmw channels	CRAN		Topic	OTA	IoT	GNSS	Topic				
TD number or other	35	30			6	25	55					
TD number or other	51	18			1	32	45					
TD number or other	40	34			52	54	44					
TD number or other	DISC	40	12-15 DISC		DISC	DISC	DISC					
TD number or other	DISC	DISC										
Lunch	13:00-14:00				13:00-14:00				13:00-14:00			
	14:00 - 15:45				14:00 - 15:45				End of Meeting			
Sessions	Technical Plenary				WG1	RA (+3)		Groups				
TD number or other	Keynotes				propagation	MMMAC MANET		Topic				
TD number or other	Prof. Jacek Rak				4	28						
TD number or other	Prof. Mariusz Kaczmarek				16	54						
TD number or other	Dr. Moray Rummy (TD #3)				43	3						
TD number or other					30	49						
TD number or other					DISC	DISC						
TD number or other												
Coffee break	15:45 - 16:15				15:45 - 16:15							
Hours	16:15 - 17:45				16:15 - 17:45							
Sessions	WG2	WG3 (+RA)		Groups	WG1	IoT-H		Groups				
TD number or other	PVCMAC	USV MANET		Topic	vehicular	Body comm		Topic				
TD number or other	17	21			2	15						
TD number or other	58	29			24	37						
TD number or other	48	57			31	47						
TD number or other	30	22			12	DISC						
TD number or other	7				58							
End time												



He also stressed that the Working Groups discussions should include the following topics:

- Next deliverables (September 2019)
- Final book
- Names of the speakers for the final workshop (1 name per WG + proposals for one or several Verticals)
- Joint activities (experiments, papers, etc.)

FRIDAY, 6 SEPTEMBER 2019

The Management Committee Meeting resumed on Friday at 11:05 am.

10. Final Book update

The Chair returned to the subject of the Final Book. He said that the draft version is online and accessible to everyone, and all the sections are almost complete.

No TDs from the final Meeting in Louvain-la-Neuve will be included, unless one of them is a final version of a TD already presented in previous meetings.

As a rule, it is preferable and more appropriate to use PDFs, vectors, BITMAPs, etc, rather than JPG formats.

The editors will circulate a Google doc including the TDs collected so far throughout the Action; all IRACON members are invited to update their TDs by double-checking and updating the title, the list of authors and the bibliographic references. The purpose is to have an updated bibliography for the final book.

The chapter editors were also invited to harmonise and adjust those sections that are still weak, as this is not just a report, but an actual book.

An OVERLEAF account is available to the chapter editors to efficiently edit and compile the document.

The final draft is expected before Christmas, therefore reminders will be sent by November for the missing chapters.

Prof. Oestges moved on to review the future versions to be released:

- **Version 1.2**
 - ✓ Only for chapters 2, 3 and 5
 - ✓ All sections completed
- **Version 2 (to be released by end 2019)**
 - ✓ For all chapters
 - ✓ Must include TDs from MCM10 and 11
 - ✓ Copy-right free figures and graphs
 - ✓ Updated references (replace TDs by papers if any)

He then informed the attendees of the Book **deadlines**.

SE: Section editors – **CE:** Chapter editors – **BE:** Book editors

AP	WHAT	WHO	WHOM	WHEN
B/5	Ask authors for copyright free graphs	SE	TD authors	Sep 15
B/5	Ask authors to fill in TD mapping table	BE	TD authors	Sep 15
B/6	Send revised sections (with MCM10&11 TDs)	SE	CE	Oct 1
B/6	Send draft chapters (tex files, bib files)	CE	BE	Oct 30
B/7	Send reminders and compile all chapters	BE	CE/SE	Nov 15
B/8	Upload final draft book	BE	Secretary	Dec 15

11. Final Meeting

The Chairman, who is also Local Organiser for the last Meeting of the Action, provided some useful details on the event, such as:

- ✓ Date of the event: Jan 27-29, 2020
- ✓ Place: Louvain-la-Neuve (BE)
- ✓ Organizer: Claude Oestges
- ✓ Possible accommodations and other logistical information

The technical programme is open to anyone, not just to IRACON Members. The first and last day will follow the usual programme, whereas the second day will look like a very long keynote speakers' day.

COST officers will also be attending the event.

12. Reports from Working Group Chairs

The WG Chairs reported about the activities carried out and the TDs presented during the technical sessions of their Working Group.

DWGs

1. WG-1 (radio channels): Sana Salous and Katsuyuki Haneda
2. WG-2 (PHY-MAC): Hanna Bogucka and Jan Sykora
3. WG-3 (NET): Silvia Ruiz and Hamed Ahmadi

EWGs

1. WG-OTA: Wim Kotterman and Moray Rumney
2. WG-IoT: Erik Ström and Chiara Buratti
 - ✓ SWG IoT-Health: Slawomir J. Ambroziak and Kamran Sayrafian
3. WG-LT: Carles Anton and Klaus Witrisal
4. WG-RA: Florian Kaltenberger and Mark Beach

13. Liaisons with International Bodies, Standards and Projects

The Action is involved with several international bodies and other projects, including:

- **3GPP** – Moray Rumney
- **URSI** – Sana Salous
- **ITU-R** – Sana Salous and Belen Montenegro
- **H2020 5G-XCAST** – Narcis Cardona
- **5G-PICTURE** – Mark Beach
- **CommNet** (EPSRC network) – Mark Beach
- **IEEE 1900.6** – Kostas Katzis
- **EurAAP** – Claude Oestges
- **EURACON** – Roberto Verdone
- **WiBEC** – Conchi Garcia
- **5G initiative** – Fernando Velez
- **Met5G** – Tim Brown
- **Clear5G** – Haibin Zhang
- **Wavecombe** – Sana Salous/Narcis Cardona
- **5G-VINNI** – Per Hjalmar Lehne
- **5G-HEART** – Per Hjalmar Lehne
- **5G-EVE** – Florian Kaltenberger
- **EMPOWER** – Per Hjalmar Lehne
- **5G-SMART** – Fredrik Tufvesson
- **MINTS** – Fredrik Tufvesson



14. Close of Meeting

Before closing the Meeting, the Chair reminded the attendees about the upcoming deadlines and Action Points:

AP	WHAT	WHO	WHOM	WHEN
11/1	Submit reimbursement forms	Those entitled to	e-cost	Sep 20
11/2	Send Minutes of Group Meetings	Group Chairs	Chair + Secretary	Sep 20
11/3	Send deliverable 8/9 inputs	Group Chairs	Chair + Secretary	Sep 20
11/4	Send speakers' names for Final Workshop	Group Chairs	Chair + Secretary	Sep 30
11/5	Register to 12th MCM	Attendees	Website	Jan 8
11/6	Request TD number	Authors	Website	Jan 8
11/7	Submit TD	Authors	Website	Jan 17



List of Annexes

Annex 1- Agenda

Annex 2- Chair's Presentation

Annex 3- List of persons entitled for reimbursement

Annex 4- List of TDs

Annex 5- TDs Schedule

Annex 6- Attendance lists