



# IP CREW

## Cognitive Radio Experimentation World

### Open Call 3



The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°258301 (CREW project).

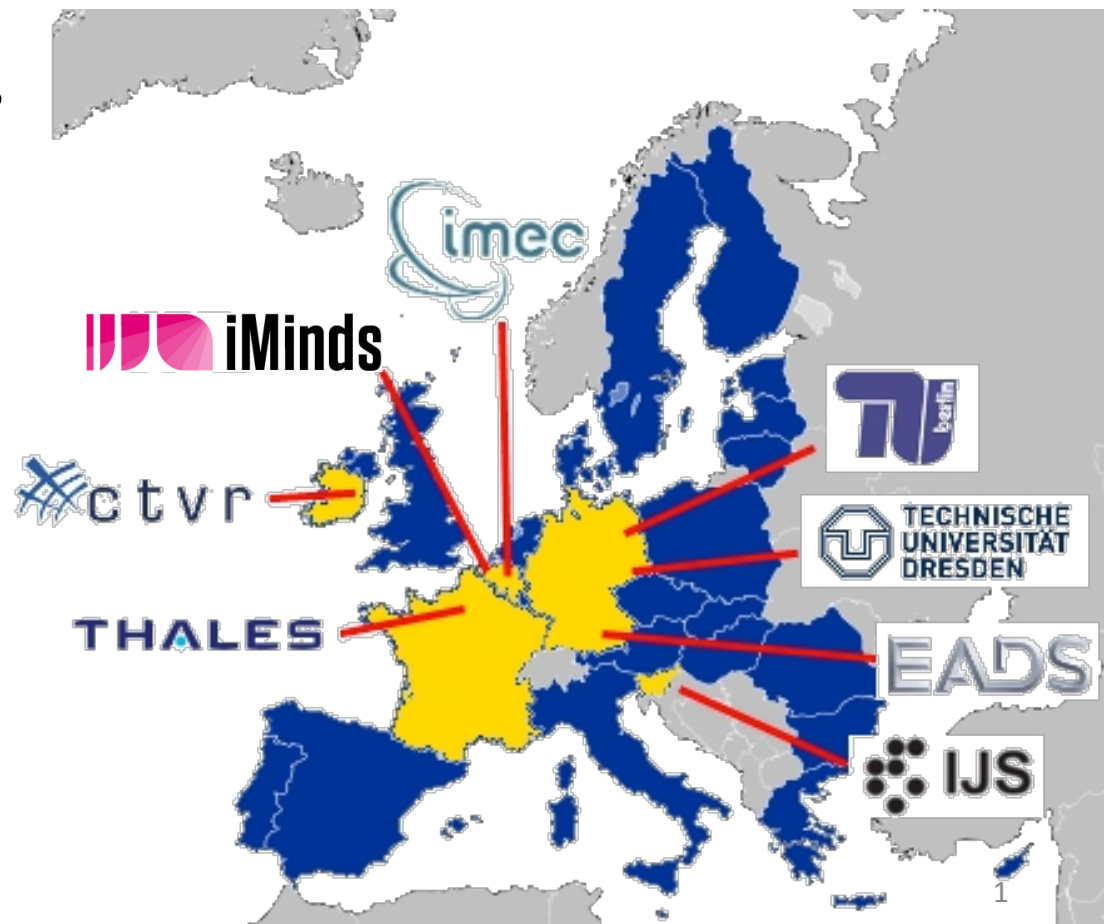


## ■ Cognitive Radio Experimentation World

- FP7 call 5 (FIRE - Future Internet Research and Experimentation Initiative)
- Project started October 2010
- 8 core partners
- 3+6 open call partners
  - UDUR (UK)
  - TUIL (DE)
  - TECNALIA (ES)
  - IT (PT)
  - CMSF (PT)
  - CNIT (IT)
  - WINGS (GR)
  - UTH (GR)
  - NICTA (AU)

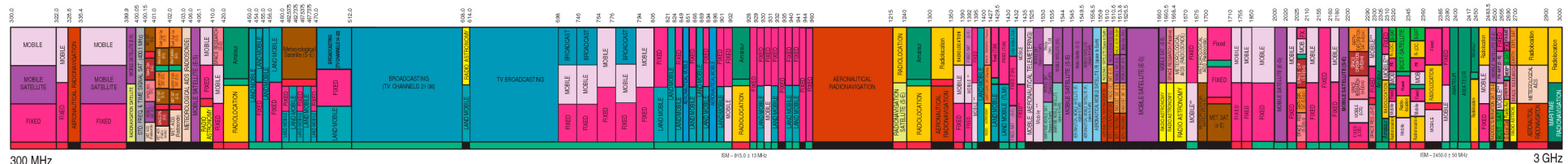
OC1

OC2



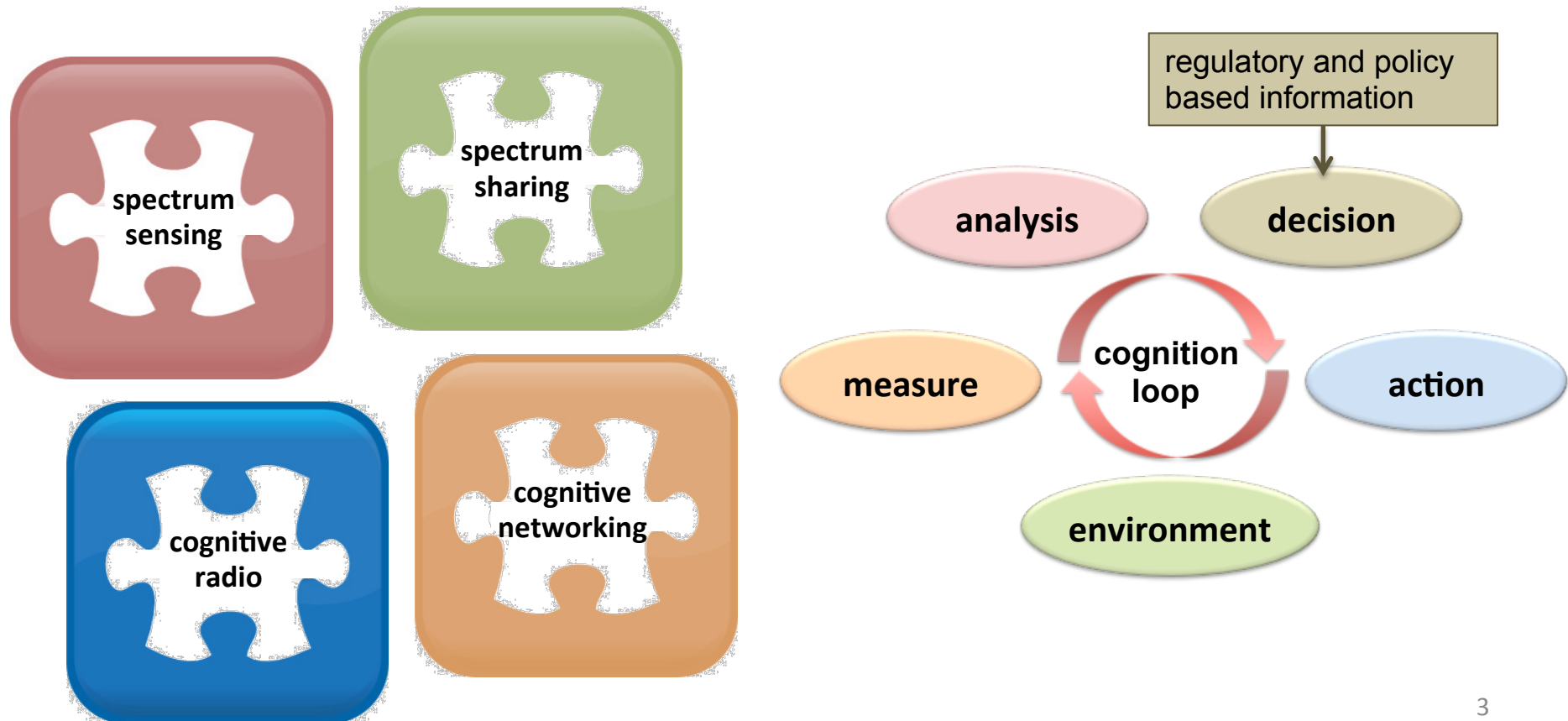
## ■ establish an **open federated test platform**, facilitating experimentally-driven research on

- advanced spectrum sensing
- cognitive radio (CR)
- cognitive networking (CN)
- spectrum sharing  
in licensed and unlicensed bands



## ■ Supporting research on CR and CN solutions

- use the available (spectrum) resources as efficiently as possible, by adapting the radios (transmitters and receivers) and networks to the wireless environment and the user needs







# IP CREW: Target

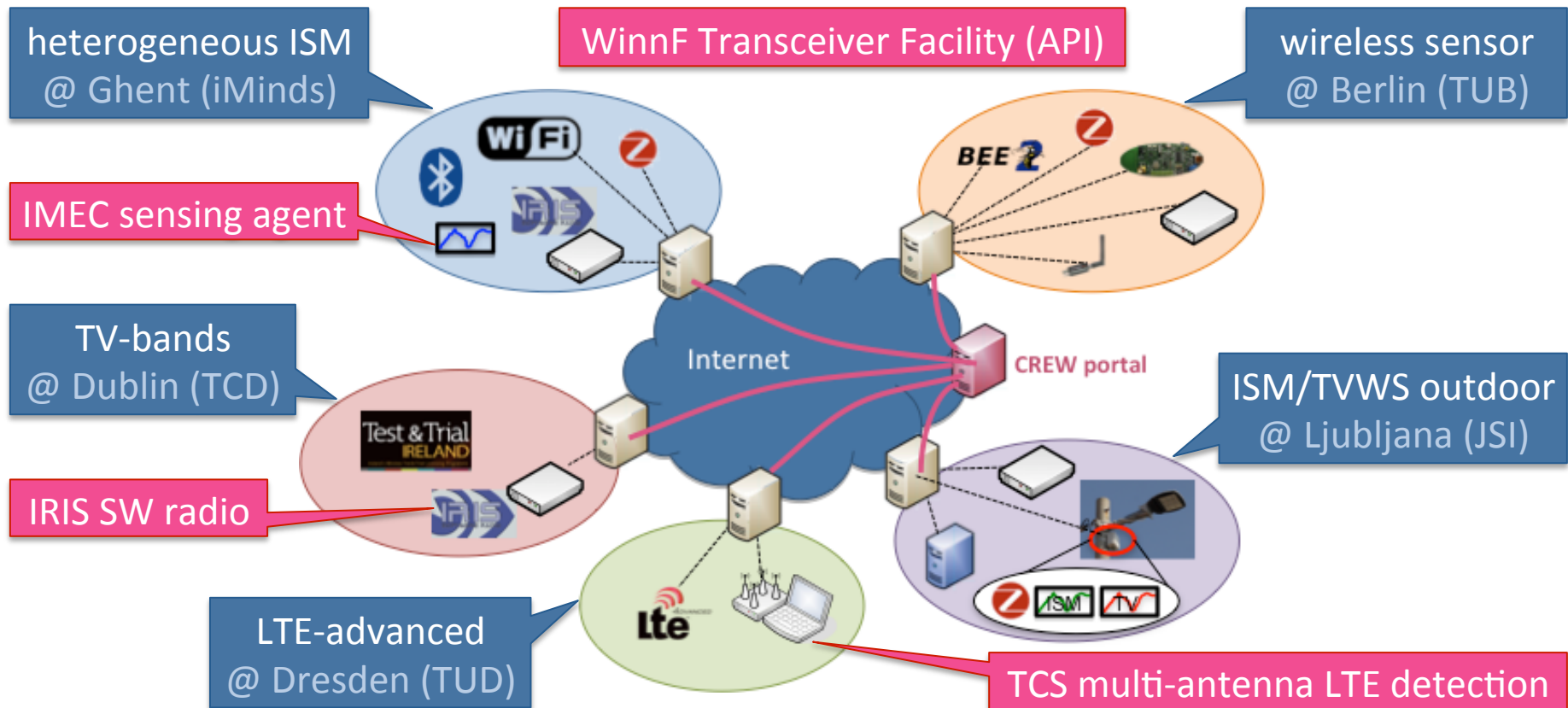




















## ■ **CREW is NOT ...**

- doing research on spectrum sensing, cognitive radio & cognitive networking
- designing new algorithms

## ■ **CREW is ...**

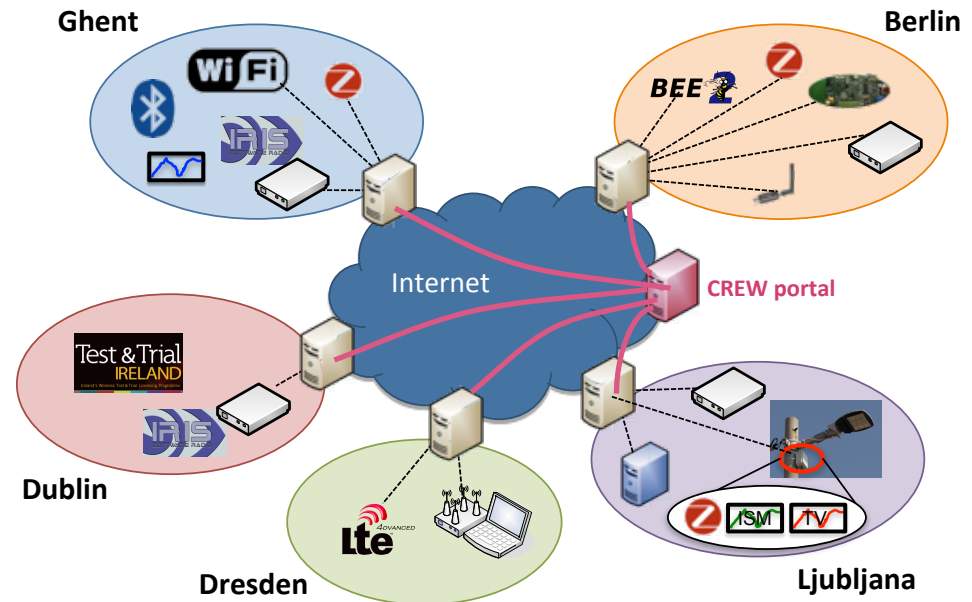
- bringing together test facilities for supporting research on spectrum sensing, cognitive radio & cognitive networking
- augment existing facilities with novel cognitive components
- bringing together expertise on experimentation
- facilitating access to heterogeneous test facilities
- offering better methodologies for experimentation (repeatability, reproducibility, comparability)
- validate advanced cognitive solutions using CREW facilities and CREW methodologies



 IEEE 802.11	 IRIS GPP-based software radio platform	 IMEC Sensing Agent
 IEEE 802.15.1	 Comreg spectrum licenses	 UHF/VHF TV sensing
 IEEE 802.15.4	 BEE2 FPGA platform	 ISM bands sensing
 LTE-advanced	 USRP software radio	 TCS Multi-antenna LTE detection
 EyesIFX nodes	 VESNA platform on light pole	 WiSpy Spectrum analyzer
 CR database		 Interconnection of portals
		 Interconn. between testbed elements

## ■ **Open access** to 5 different testbed islands and advanced cognitive components

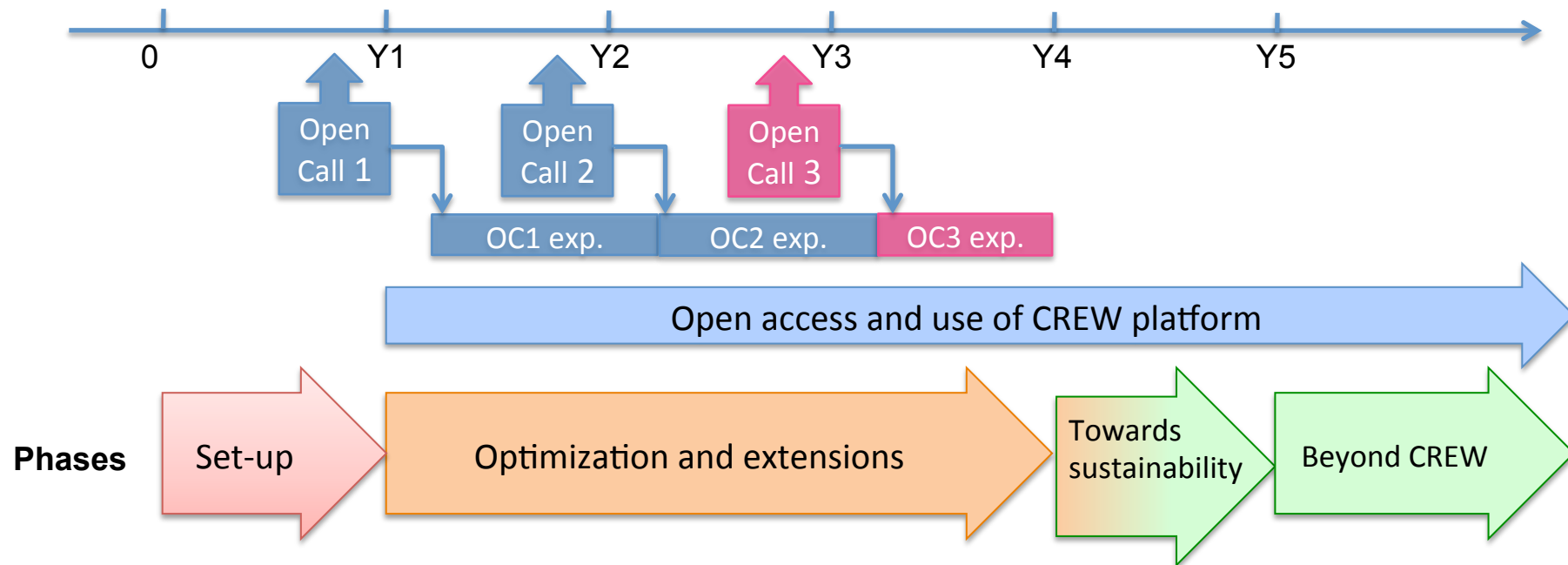
- different wireless technologies
- different spectrum bands
- mature testbeds
- methodologies and tools for experimentation
- reproducible test conditions
- expertise from PHY layer to application layer



## ■ **Portal** with detailed information and guidelines on access and use of the facilities ([www.crew-project.eu](http://www.crew-project.eu))

## ■ **Technical support & assistance** to your experiments

- methodologies for experimentation
- open call 3 for free and guaranteed support to your experiments





# CREW Open Call 3 – general info



## ■ (Past) Open Calls 1 & 2

- EC funding for experimenters: 400 k€ (OC1) & 440 k€ (OC2)
- Standard FP7 proposal & standard FP7 evaluation process
- Experimenters become official partners (accession to Grant Agreement)

## ■ Open Call 3

- EC funding for experimenters: 0 k€, BUT free and guaranteed training & support by CREW partners (covering training, technical assistance, extensions to experimentation tools...)
- Simplified proposal & blind peer review process by external experts
- Cooperation through Memorandum of Understanding (MoU)

	+	-
Open Call 1 & 2	<ul style="list-style-type: none"><li>• EC funding</li><li>• Guaranteed support by CREW</li></ul>	<ul style="list-style-type: none"><li>• Complex proposal</li><li>• Complex evaluation process</li><li>• Complex administration (GA, CA, official deliverables)</li></ul>
Open Call 3	<ul style="list-style-type: none"><li>• Simple proposal</li><li>• Fast evaluation process</li><li>• Simple administration (MoU, short final report)</li><li>• Guaranteed support by CREW</li></ul>	<ul style="list-style-type: none"><li>• No EC funding</li></ul>



## CREW Open Call 3 – specific call info



- Target number of experiments to be supported: **4-8**
- Number of partners per experiment: **1 or 2**
- Call deadline: **Wednesday, October 2, 2013**
- Earliest start date of experiment: **1 January 2014**
- Latest end date of experiment: **30 September 2014**
- Maximum duration of experiment: **6 months**
- Address for proposal submission: **[info@crew-project.eu](mailto:info@crew-project.eu)**
- Call identifier: **CREW2013-OC3**
- Language of the proposal: **English**

## 1. Advanced spectrum sensing algorithms

- **Heterogeneous distributed** sensing;
- **Local versus distributed** spectrum sensing techniques;
- **Simple versus advanced** spectrum sensing techniques;
- Impact of the **quality of the sensing hardware** on spectrum sensing resolution and accuracy (COTS versus advanced HW);
- The effect of **controlled mobility** (via mobile robots) on spectrum sensing
- ...



## 2. Coexistence of wireless networks in unlicensed bands: realization of the cognition loop

- New **algorithms, protocols and networking** architectures for solving the spectrum bottleneck in ISM bands enabling coexistence between wireless devices and (heterogeneous) technologies.
- Cognitive networking **monitoring techniques** (all layers) and understanding of the complex and dynamic wireless environment through intelligently combining the distributed local information.
- **Local versus collective** cognitive **decision and control**;
- **Cross-layer, cross-node, cross-network, cross-technology optimization** strategies;
- Analysis of same cognitive solution in **different physical wireless environments** or applied with **different test scenarios**;
- The effect of **controlled mobility** (via mobile robots) on higher layer cognitive radio / cognitive networking protocols
- ...

## 3. Coexistence of wireless networks in licensed bands:

- Analysis of **interference in a primary system** (e.g. LTE, DVB-T), caused by a cognitive radio solution;
- Analysis of **robustness of a secondary system** towards interference from a primary system (e.g. LTE, DVB-T);
- Impact of **erroneous and/or inaccurate sensing** information;
- Techniques/protocols to deal with **harmful interference** from both primary and secondary side;
- **Flexible PHY** for cognitive radio
- Design of **geo-location database architecture** (communication between sensing nodes and decision node, data storage format, update frequency for sensing...)
- ...



# CREW Open Call 3 – Terms & conditions



## ■ Requirements/restrictions

- Each proposal must make use of the CREW facilities: implementation and validation of the experiment must happen on the CREW facilities
- The proposed experiment must lead to a public demonstration and/or a scientific publication
- CREW hardware cannot be moved outside the CREW testbeds.

## ■ Proposal evaluation

- Acceptance rules
  1. Technical novelty
  2. Feasibility of the experiment
  3. Availability of resources (infrastructure, manpower)
- Approach
  1. Blind peer review process by external experts
  2. Final selection of proposals by CREW StC
  3. Final approval by EC



# CREW Open Call 3 – Proposal template



## ■ **Proposer information**

- Contact information
- Profile & expertise of proposers (max. ½ page / organization)

## ■ **General experiment evaluation**

- Title, acronym, start date & duration

## ■ **Experiment description**

- Concept & motivation (max. ½ page)
- Specification of experiment (max. 2 pages)
- Use of the CREW federation (max. ½ page)

## ■ **Impact of the experiment** (max. ½ page)

## ■ **Terms & conditions**

- See next slide



# CREW Open Call 3 – Proposal template



## ■ Terms & conditions

### Terms and conditions

Successful proposers in this third open call will gain access to the CREW testing facilities for a maximum duration of 6 months, free of charge and with guaranteed support. There are however some restrictions that need to be followed, as stipulated in the Memorandum of Understanding for using the CREW facilities for experimentation (see Annex III of the CREW Announcement document for Open Call 3).

- ☐ By ticking this box the proposers indicate that, in case this proposal is successful and when they execute their experiment using the CREW facilities, they agree with the conditions as stipulated in the “Memorandum for Understanding for using the CREW facilities for experimentation”.
- ☐ By ticking this box the proposers confirm that, in case this proposal is successful, they have the necessary manpower resources to execute the proposed experiment.



# More info on CREW



## ■ Contact

- Ingrid Moerman – iMinds
- Phone: +32 9 33 14 925
- Mail: [ingrid.moerman@intec.ugent.be](mailto:ingrid.moerman@intec.ugent.be)

## ■ Website

- [www.crew-project.eu](http://www.crew-project.eu)
- Including demo videos from OC1 and OC2 experiments

## ■ Newsletter

- Subscribe to:  
<http://www.crew-project.eu/subscribe>

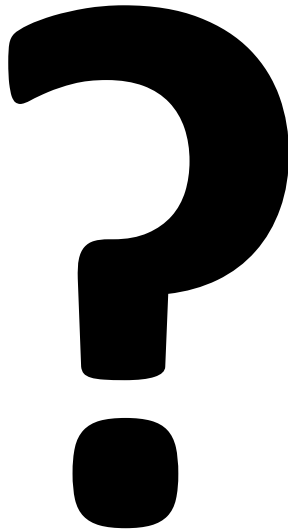
## ■ Info on open call 3

- CREW website (<http://www.crew-project.eu/opencall3>)
- CREW newsletter
- Exhibition/demo booth at Future Networks & Mobile Summit (July 3-5, 2013, Lisbon, Portugal)



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## CREW training days: 14 – 15 January 2014