

# Open, Programmable Wireless Networks

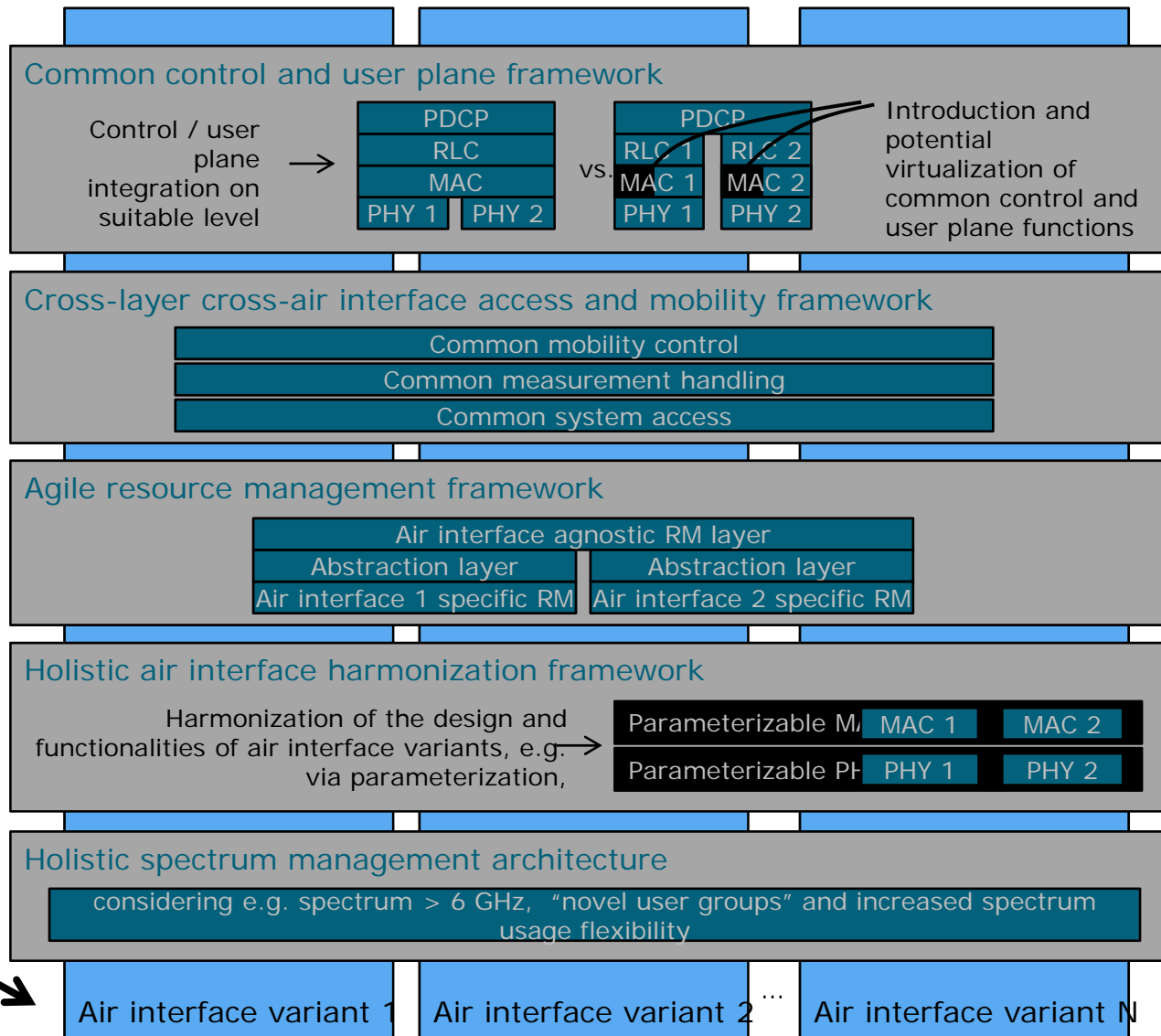


Ivan Seskar



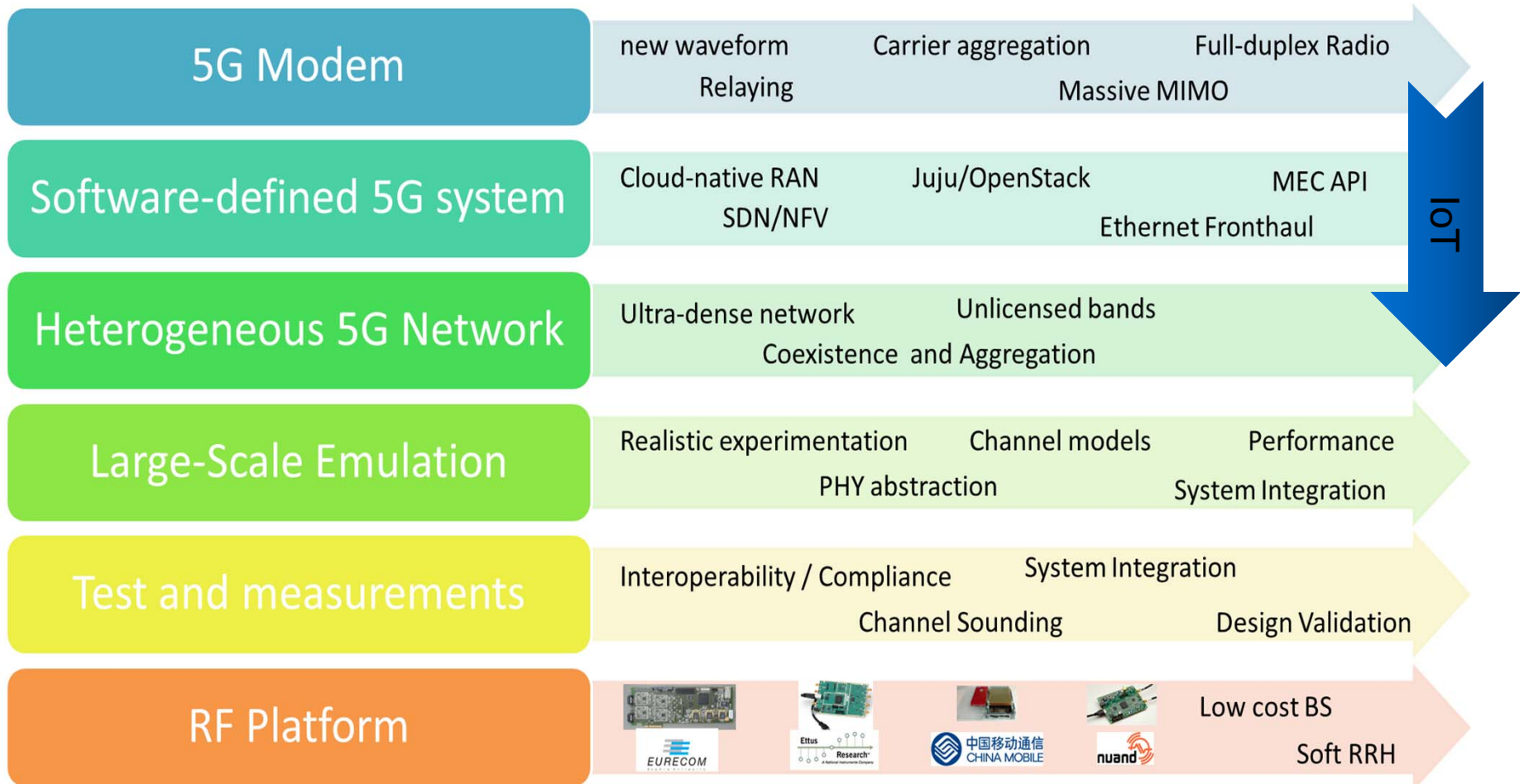
Rutgers, The State University of New Jersey

# METIS-II (Key Innovation Pillars)



Air interface details studied in other projects, e.g. METIS, FANTASTIC-5G, mmMAGIC

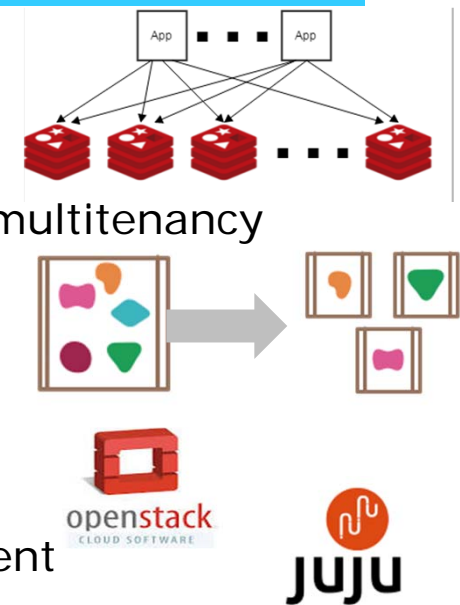
# OAI Strategic Areas



# OSA Roadmaps Toward Software-define 5G Network

## □ Cloud-native 5G networks

- Phase 1: Stateless through distributed shared memory, multitenancy
- Phase 2: Mircoservice Architecture and NFV
- Supported projects: FP7 MCN, FUI ELASTIC



## □ Network Orchestration

- Approach 1) Openstack and heatstack orchestrator
- Approach 2) Juju modeling for service-oriented deployment (<https://jujucharms.com/q/oai>)
- Supported project: FP7 MCN, FP7 FLEX, Canonical partnership program

## □ Network Programmability → network slicing

- Agent-controller protocol and southband API in support of SDN+MEC
  - agents: in charge of network function monitoring and programmability
  - Network controller: network abstraction (network state graphs), network application
    - realtime, standalone mode or as a plugin
- Supported projects: H2020 Coherent, H2020 Q4Health, ETSI MEC PoC

# Program Experimental License

- **New type of experimental license:** *“Establishes program experimental licenses for colleges and universities with an accredited graduate research program in engineering, research laboratories, manufacturers of radio frequency (RF) equipment, manufacturers that integrate radio frequency equipment into their end products and health care institutions to allow broad experimental authority under a single license.”*
- **Eligibility**
  - ABET accredited college or university with a graduate research program in engineering
  - A research laboratory (not limited to federally funded)
  - A hospital or health care institution (non-clinical trial testing only)
  - A manufacturer of RF equipment or a manufacturer that integrates RF equipment into its end products.

# Program Experimental License (cont'd)

## □ **Special Requirements for:**

- *Restricted Frequency Bands*
- *Critical Service Bands*
- *Federal Spectrum*

## □ **N (five?, ten?) days before each experiment\*:**

- "a narrative statement describing the experiment, including measures to avoid causing harmful interference to any existing service licensee in the proposed band"
- "contact information for the researcher in charge of the experiment;
- contact information for a "stop buzzer" point of contact – a person who can turn off the equipment if interference occurs"
- "technical details including frequency, power, bandwidth, modulation, location, number of units, etc."
- "for commercial mobile, emergency notification, and public safety frequencies, a list of potentially affected licensees"

# Program Experimental License (cont'd)

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- ❑ Rules have officially become effective as of ***January 14, 2016***.
- ❑ But: new forms and reporting WEB site are not yet up (will take a few more weeks according to “reliable sources”)
- ❑ Perfect fit: intended to foster innovation
- ❑ Has significant implication on wide area experimentation especially with SDRs and non-traditional RF front-ends.
- ❑ (the rule also includes two other experimental licenses: the Medical Testing License and the Compliance Testing License)

# “Missing Link”: Outdoor Deployable Wireless Units?

