



Technological
Educational
Institution (T.E.I.) of Athens



Faculty of
Technological
Applications
Department of Electronics
Engineering



Wireless Communications & e-Applications
Research Group

www.wicear.teiath.gr

July 2013

Outline

- ▶ The T.E.I of Athens
- ▶ The Dept. of Electronics Engineering
- ▶ The WiCeAR Lab



T.E.I. of Athens @ a glance

The T.E.I. of Athens is the *third biggest* Institution of Higher Education in Greece. It has:

- ▶ more than **35.000 students**
- ▶ **5 Faculties** with a total of **36 Departments** that cover almost all the scientific and technological Disciplines
- ▶ employs more than **2300 people** (Academic and Administrative Staff, Researchers and specialized Technicians)



Web Site:


www.teiath.gr

The Department of Electronics Engineering

1 Undergraduate Studies (BSc)

- ▶ 240 ECTS course
- ▶ Aims at covering the fields of:
 - Industrial automatization
 - Telecommunications
 - Informatic technology and their services

2 Postgraduate Studies (MSc)

- ▶ 2 years MSc course:  "Advanced Electronics Systems"

3 Research (PhD)

- ▶ 4 Research Labs

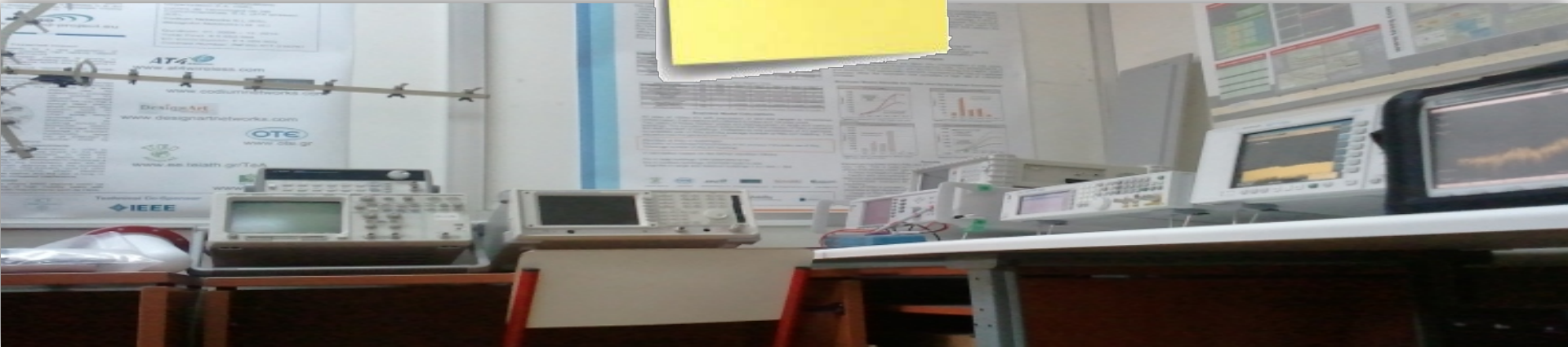


Web Site:
www.ee.teiath.gr

The WICEAR group

Web Site:

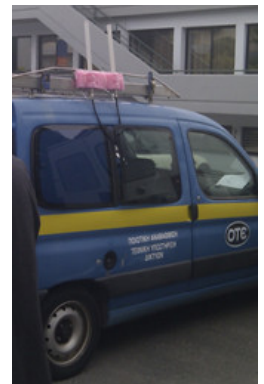
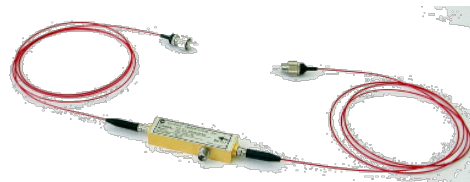
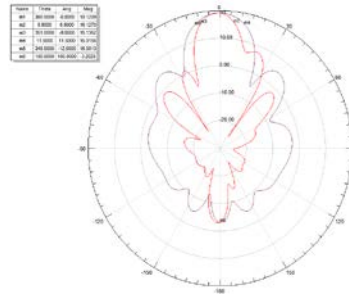
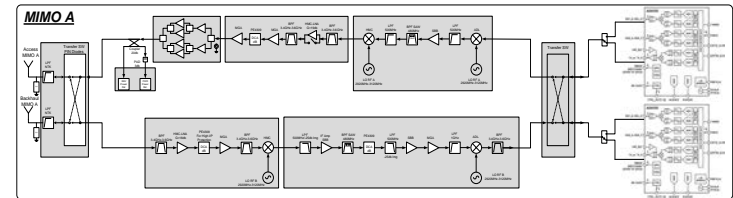
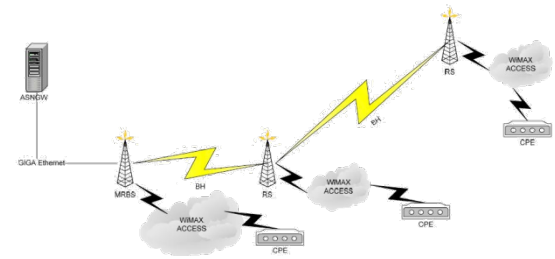
<http://wicear.teiath.gr>



WICEAR research group was founded in 2008 by Dr. K. Voudouris. It participates in various research projects funded by the EC and national resources, having scientific and administrative role accumulating this way a quite extensive experience in performing and managing Research Projects.

Main Research Areas

- ▶ Wireless Communications Systems & Networks
- ▶ Antennas
- ▶ Microwave Subsystem design
- ▶ millimeter Wave Substrate Integrated Waveguides
- ▶ WMAN/WLAN radio planning
- ▶ Web Applications
- ▶ RoF Antenna interface
- ▶ RFIDs



Equipment

WICEAR group uses the facilities and equipment of *Microwaves Laboratory*

Hardware

- ▶ Vector Signal Generator (100KHz – 6 GHz)
- ▶ Signal Analyzer (20Hz – 8,4 GHz)
- ▶ Signal Generator (up to 10GHz) BTS Master (up to 7 GHz)
- ▶ Spectrum Analyzer & VNA Master (up to 6 GHz)
- ▶ Field meter (88MHz – 2.5GHz)
- ▶ Field meter (100KHz – 5GHz)
- ▶ Spectrum Analyzer (up to 3GHz)
- ▶ Field meter suitable for satellite communications
- ▶ X-band CW/AM generators and waveguide measurements set up

Software

- ▶ Agilent-Advanced Design System 2009 (CAD and simulation tool)
- ▶ Cellular Expert (Radio planning CAD tool)



Partnerships

- ▶ Mobile and Satellite Communications Research Center(MSCRC) of Department of Engineering Design and Technology of **University of Bradford** (UoB), UK
- ▶ Research Department of the Hellenic Telecommunications Organization (**OTE**), Greece
- ▶ Associate Membership at the Hellenic Semiconductors Industry (**HSIA**)
- ▶ Member of **Corallia** Nano/Microelectronics based Systems and Applications Cluster (mi-Cluster)
- ▶ Member of the **WiMAX** forum
- ▶ Member of the Radio and Spectrum Matters (**RAS**) cluster of the EU
- ▶ Alternate Member of **COST Action IC0902** – Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless Networks



Recent Research Projects

RElay based WIREless Network and standard (REWIND)



- ▶ Relay based Wireless Network and standard (REWIND)
- ▶ FP7 ICT project no: 216751
- ▶ Budget: Total cost is 5.652.564 euros (4.000.902 euros EC contribution). WiCeAR's Budget is 800.000 euros and acts as coordinator.
- ▶ Duration: 01/01/2008–31/12/2010
- ▶ Partners: TEI Athens (GR), Ubiqam (ISR), OTE (GR), AT4 wireless (ES), CODIUM (ES), DesignArt (ISR)
- ▶ Coordinator: Dr. K.N. Voudouris, Asc. Prof. of Telecommunications
- ▶ Description: REWIND project has created low-cost, easy to install Relay Stations providing the necessary capacity and coverage to support new wireless applications with similar QoS currently available only through wired broadband service (e.g. DSL).

Main achievements



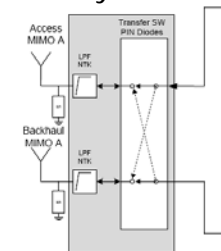
MRBS system



RS system



RS enclosure



2x2 switch matrix (>90dB)

Recent Research Projects (*cont'd*)

Next Generation Millimeter Wave Backhaul Radio (NexGen-MiliWave)

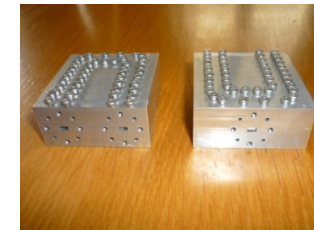
- ▶ Total Budget: 4.000.000 Euros
- ▶ Budget for WiCeAR: 185.000 Euros
- ▶ Duration: 30 months (1/6/09 to 31/12/2011)
- ▶ Partners: Analogies (GR), Fasmetrics (GR), Prisma (GR), Sciensis (GR), ΘHTA (GR), MFOL-NTUA (GR), APEL (GR), VLSI (GR), THMMY-ΑΠΘ (GR), AUTH-PHY (GR), WiCeAR-Group (GR), OTE (GR)
- ▶ Coordinator: Theta Microelectronics
- ▶ Description: NexGenMiliWave was a research project in the framework of Corallia. Its main objective was to develop and demonstrate the operation of an experimental radio modem based on microwave nanoelectronic structures in millimeter-wave frequencies at 60 GHz, which are used in highly secure communications and satellite communications.



Main achievements



SIW diplexer



5th and 7th order Chebyshev



8x8 SIW slot antenna array

WICEAR Staff

Current Staff

▶ Permanent Staff

- Dr. Kostas N. Voudouris (Head of Group)
 - Asc. Professor of Wireless Telecommunications
- Dr. Panagiotis Tsiakas
 - Lecturer of Algorithmic design and software development

▶ Postdoctoral Research Fellows

- Dr. Ioannis Petropoulos (BSc, MSc, PhD)
 - RF design, Antennas & Propagation

▶ Research Assistants

- Iraklis Georgas (BSc, MSc, MPhil, PhD candidate)
 - Algorithm design



WICEAR Staff (*cont'd*)

Previous Staff

▶ Postdoctoral Research Fellows

- Dr. Nikolaos Athanasopoulos Dipl.Ing. PhD (2010 – 12)
 - Current position: Director, Communications Network, of the Greek Rail
- Dr. Spiridon Mikroulis, BSc, MSc, PhD (2011 – 13)
 - Now works as Postdoc fellow at the Imperial College in UK

▶ Research Assistants

- Mr. Nikolaos Mavrakis, BSc, MSc (2008–10)
 - Now works as Telecoms Engineer at the Civil Aviation Authority in Greece
- Mr Zafiris Pantelis, BSc, Msc (2010 – 11)
 - Now works as Radio Network Planning Engineer at Huawei Technologies, Switzerland
- Mr. Panagiotis Spanos BSc, MSc
 - Now works as R&D Engineer at IknowHow S.A., Greece
- Mr. Panagiotis Sotiropoulos BSc