

# Institute for Applied Microelectronics

#### Information and Communication Systems















#### Gran Canaria

Location: 28.06 N, 15.25 W

Population: 838,397 (Dec. 2009)

Surface: 1,560 square kilometres



International Airport: 9,155,670 passengers in 2009

Average temperature: min. 18°C / max. 30°C

University Las Palmas GC: 22,000 students

#### Introduction





IUMA main building, Scientific and Technology Park, Univ. Las Palmas de GC

March 2012

#### Introduction



IUMA started it activities in the late 80s The first out of 6 research institutes at ULPGC ▶ 35 PhD, 3 technicians, 10 PhD students, 26 MsC students Areas of expertise in microelectronics, signal processing computer science and mathematics Strong presense in important international initiatives Access to the Canary Supercomputing Center (ATLANTE) More than 3 M€ in projects and grants (2009-2010) SSURAN

RODUCTION

#### Introduction



More than 73 R&D contracts
More than 200 papers in international conferences
More than 70 paper in international journals
Contributions to the creation of 8 spin-offs



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#### IUMA organization

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#### **IUMA** mision





► To promote, organize and co-ordinate applied research in the field of microelectronics science and technology, telecommunications and information systems

- To facilitate transferring the results of this research to national and international industry
- ▸ To conduct its own research programmes, promoting collaborative alliances with public and private entities in Spain and abroad
- ► To educate skills engineers with a broad knowledge in state-of-the-art electronic equipment, CAD tools, telecommunications, VLSI technologies & methodologies

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#### **IUMA** vision

**IUMA** 





- ▶ To be part of the success of national and international initiatives in the information technology sector, by efficiently tranferring our knowledge and experience to industry
- To lead a cultural and economical change in the Canary Islands by the creation of new technology spin-offs
- ▶ To have our enginners well positioned in national and international IT companies, enhancing our contact networks and opening new avenues to the realization of important advances
- To become an international reference in our fields of expertise

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#### IUMA in the world





#### IUMA in the world





#### IUMA in the world





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# Network infrastructure

- Network analyzer
- 9 servers
- 27 SUN stations
- 96 PCs

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### Fabrication and circuit prototypes

- Optical fiber

- Comm equipment for 10 GbE

- Multilayer PCB facilities
- Optical inspection system
- Component pick & place equipment

# Technologies and CAD tools

- CADENCE, Synopsys, CoWare, Mentor Graphics, Avant, Innoveda, Verisity, APLAC, Agilent, Coventor Ware
- Alcatel, AMS, TSMC and EUROPRACTICE portfolio
- FPGA facilities: Xilinx, Altera, ARM
- Mentor Graphics VStation for system emulation
- Microprobbing station for RF measurements

c ā d e n c e " **GRAPHORES**Synopsys





Agilent Technologies



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IUMA traffic analyzer equipment and VSTATION for systems emulation

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IUMA IC testing facilities

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IUMA pick-and-place facilities for Printed Circuit Boards (PCB)

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IUMA Microprobing equipment for RF characterization

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I.a. Integrated systems for multimedia applicationsI.b. Integrated systems for communication applicationsI.c. Integrated systems for space applications

#### II. Information Technology

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II.a. Colaborative and semantic recommendation systems for multimedia content distribution
II.b. Social networks and web 2.0
II.c. Publicity in web applications directed to final users
II.d. Augmented reality for mobile devices
II.e. Security in communications
II.f. Programmation languages and compilers





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#### Research & Development

#### III. Industrial Systems and CAD

III.a. Embedded systems and industrial systems
III.b. Control systems for industrial applications
III.c. Equipment integration
III.d. Prototyping
III.e. Eco-electronics
III.f. Modeling and SoC implementation

#### **IV.** Computational Geometry

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IV.a. Mesh algorithms and triagularizationIV.b. Finite Element Methods (FEM)IV.c. 3D refinement/derefinement algorithmsIV.d. Geometrical design and modeling of solids





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#### Research & Development

#### V. Microelectronics Technology

- V.a. Design, measurement, characterization and modeling of integrated components for RF applications
- V.b. Integrated circuits for GPS, WiFI, ultra wide band and digital terrestrial television



#### VI. Microeletromechanical Systems

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VI.a. System and microsystem optimization VI.b. GPS/Galileo/GLONAS based systems and applications VI.c. Micro-switches VI.d. Microfuidics





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#### Research & Development



#### VII. Equipments and Comm. Systems

VII.a. Access control systemsVII.b. Networks securityVII.c. Petri networks applied to communicationsVII.d. Electronic banking security







# Control and acquisition electronics for primary mirror in GRANTECAN telescope



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Core for ambient and mobile intelligent imaging applications (CAMELLIA)



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# Low cost 32x32 crosspoint switch integrated systems for high speed communications

1.6 Gbps Low-Cost 32x32 Crosspoint Switch





• 320 Gbps Intelligent Switch Fabric



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# Wireless technologies for small area networks with embedded security and safety (WITNESS)





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#### GPS vehicle geolocalization





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#### Conclusions

**IUMA** 



Young and dynamic R&D group
Access to cutting edge technologies
Ample experience with industry
Expertise in:

- Microelectronics and integrated systems
- Computer science
- Equipment and control systems for industrial applications
- CAD tools
- MEMS and sensors
- Communications and security

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# Institute for Applied IUMA Microelectronics

#### Information and Communication Systems

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