

POLITÉCNICA

UNIVERSIDAD POLITÉCNICA DE MADRID

www.upm.es



THE CONTEXT

Of 42 million people who live in Spain, 5,7 million live in the region of Madrid.

Of 70 universities with 1.5 million students in Spain, 13 universities with a total of a quarter of a million students are located in Madrid. Seven of them are private.

UPM is the only exclusively technical university in Madrid and the largest and oldest technical University in Spain.



UNIVERSITY RANKING

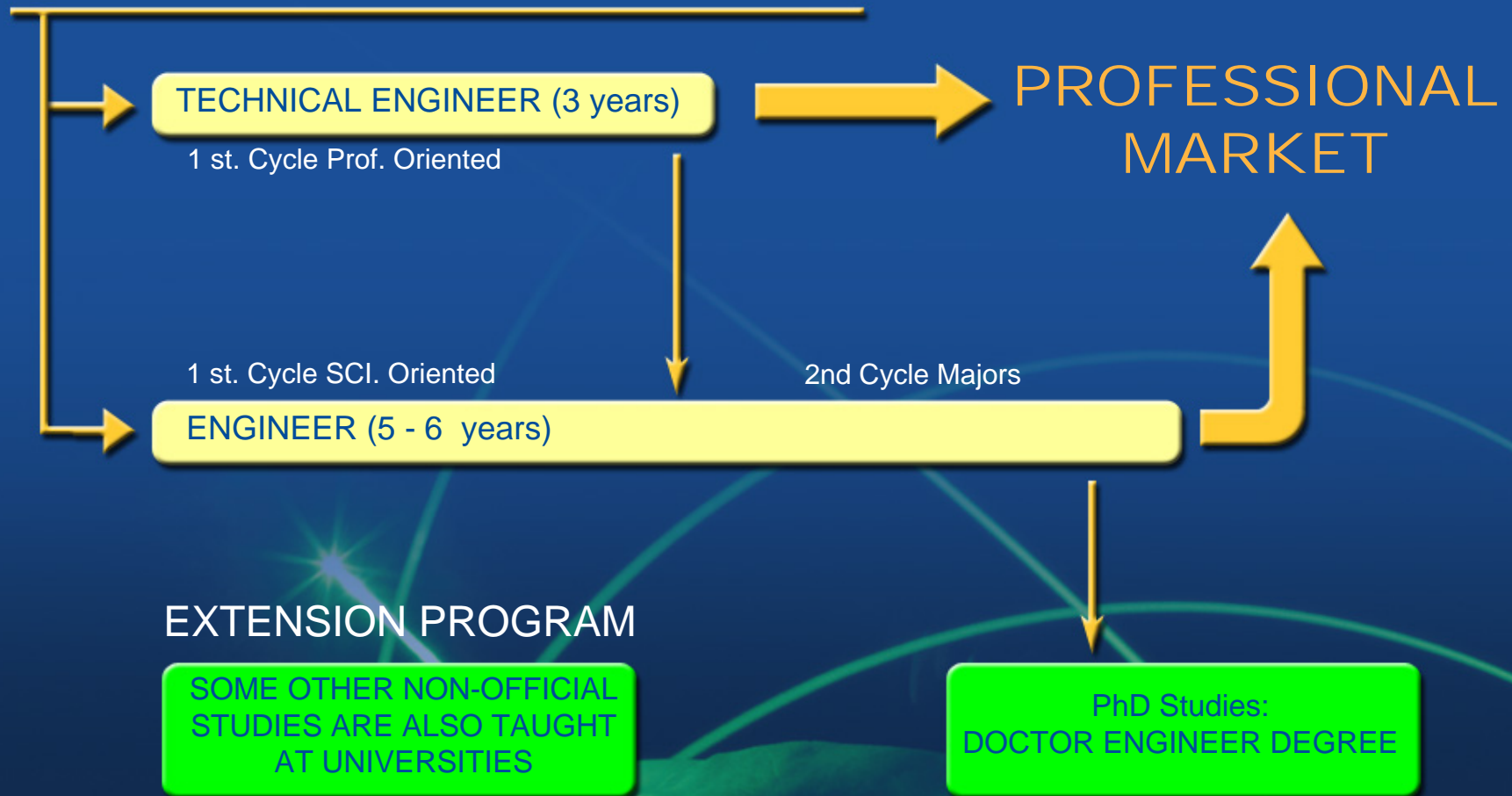
BY NUMBER OF STUDENTS (2003)



UNIVERSIDAD NACIONAL DE EDUCACIÓN A DISTANCIA (UNED)	118.960
UNIVERSIDAD COMPLUTENSE DE MADRID	90.848
UNIVERSIDAD DE SEVILLA	67.147
UNIVERSIDAD DE BARCELONA	60.473
UNIVERSIDAD DE GRANADA	55.479
UNIVERSIDAD DE VALENCIA (ESTUDI GENERAL)	51.164
UNIVERSIDAD DEL PAÍS VASCO	50.041
UNIVERSIDAD POLITÉCNICA DE MADRID	41.868
UNIVERSIDAD AUTÓNOMA DE BARCELONA	39.066

OFFICIAL ENGINEERING STUDIES IN SPAIN

After High School (18 years old)



UPM CREATED IN 1971: MERGING OF CENTENARY ENGINEERING SCHOOLS



CIVIL, INDUSTRIAL, ARCHITECTURE, AERONAUTICAL, FORESTRY, AGRICULTURE, MINING, NAVAL, TELECOM., COMPUTER SCIENCE AND OTHER



FIRST TECHNICAL UNIVERSITY IN SPAIN

UPM FIGURES AT 2004:

11 ADVANCED ENGINEERING SCHOOLS (5 TO 6 YEARS ENG. AND PhD DEGREES)

9 ENGINEERING SCHOOLS (3 YEARS ENGINEER DEGREE)

37.000 UNDERGR. STUDENTS
6.800 MASTER STUDENTS
2.500 PhD STUDENTS

3.300 FACULTY MEMBERS
2.100 SUPPORTING STAFF
1.000 PROFESSIONAL STAFF

30 ENGINEER DEGREE
> 50 PhD PROGRAMS

SOME FIGURES WORTH MENTIONING

SCHOOLS AND COLLEGES 20

ACADEMIC DEPARTMENTS 111

RESEARCH INSTITUTES & CENTERS 9

TEST LABORATORIES 3

DISTANCE LEARNING CENTER

START-UP INCUBATOR FACILITY

TECHNOLOGY TRANSFER & PATENT OFFICE



ENGINEERING CENTERS AT UPM

ADVANCED CENTERS

(5/6 year degree)

AERONAUTICAL ENGINEERING

ARCHITECTURES

AGRICULTURAL ENGINEERING

CIVIL ENGINEERING

INDUSTRIAL ENGINEERING

MINING ENGINEERING

FORESTRY ENGINEERING

NAVAL ENGINEERING

TELECOMMUNICATIONS ENGINEERING

SURVEYING ENGINEERING

COMPUTER SCIENCE

SPORTS & PHYSICAL ACTIVITIES

TECHNICAL SCHOOLS

(3 year degree)

AERONAUTICAL ENGINEERING

TECHNICAL ARCHITECTURE

AGRICULTURAL ENGINEERING

PUBLIC WORKS ENGINEERING

INDUSTRIAL ENGINEERING

FORESTRY ENGINEERING

TELECOMMUNICATIONS ENGINEERING

COMPUTER ENGINEERING

RECENT NEW DEGREES

(IN ALREADY EXISTING CENTERS)

- > Environmental Sciences (Two cycles)
- > Chemical Engineering (Two cycles)
- > Geology Engineering (Two cycles)
- > Geodesy and Cartography Eng. (2nd cycle)
- > Materials Engineering (2nd cycle)
- > Energy Engineering (2nd cycle)

UPM'S STRATEGY FOR THE SHORT TERM

“UPM is arranging its study programs to comply with the Bologna Declaration in order to facilitate the combination of studies among UPM and any international network of leading universities”.

UPM is working towards a 240-ECTS engineering degree as the Bologna Declaration suggests”.



UPM LOCATIONS IN MADRID



UPM is spread around 3 Campuses
The main one in downtown Madrid



The other two Campuses count with
Technological Parks (North & South of Madrid)



In addition, 2 of the oldest Schools are in
downtown independent locations

INSTITUTES & RESEARCH CENTERS

Most of them are Multidisciplinary

Automotive Industry

Genomics for Plants

Microgravity

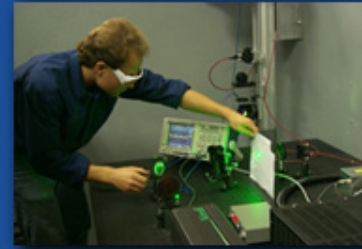
Solar Energy

Lasers

Opto & Microelectronics

Intelligent Transport Systems

Smart Homes



NEWEST CAMPUS (NORTH OF MADRID)

MONTEGANCEDO CAMPUS

**NEW
TECHNOLOGICAL
PARK**
RESEARCH CENTERS



**COMPUTER
SCIENCE
SCHOOL**



PhD PROGRAMS

DEPARTAMENTAL PROGRAMS

- > **One year of courses**
- > **Another year of directed Research**
- > **Thesis (2 – 3 additional years)**

25% Int'l Students

POSTGRADUATE PROGRAMS: STUDENT'S DISTRIBUTION

Distribution for 100 students:



52% of Master's Students in Madrid are with UPM
24% Master's Students in Spain are with UPM

PROFESSIONAL POST-GRADUATE PROGRAMS

Masters Programs



At least two semesters

Specialization Programs



One semester

Continuing Education Courses

35% Foreign Students

INTERNATIONAL RELATIONS

UNDERGRADUATE STUDENT EXCHANGES

- DIPLOMA PROJECT
- ONE ACADEMIC SEMESTER
- ONE ACADEMIC YEAR
- DOUBLE DEGREE

**OVER 1400 STUDENTS ANNUALLY
50 DOUBLE DEGREE AGREEMENTS**

INTERNATIONAL RELATIONS

DOCTORAL STUDENTS

- **Short stays (3 months a year)**
- **Research oriented**
- **Funded by Research Agencies (up to 3 years)**



INTERNATIONAL RELATIONS

Faculty Staff (peer to peer relations)

FINANCED BY UPM:

- SHORT STAYS
(several weeks)
- SABBATICAL PERIOD
(up to one year)



RELATIONS WITH LATIN AMERICA

INTER-UNIVERSITY DOCTORATES (25 PROGRAMMES)

Cooperation with Latin American Universities

Courses and Thesis pursued Part-time in a LA University

JOINT RESEARCH IN DIVERSE DISCIPLINES

> 40 RESEARCH PROJECTS FUNDED BY UPM

SUPPORT FOR ACCREDITATION





RESEARCH
AT
UPM

- 
- Around 2000 own Scientific Staff, 1500 PhD students and 500 Support Personnel.
 - Extensive Cooperation with Industry in Spain and internationally.
 - App. 80% of the Research Performed at UPM is financed by External private sources.
 - From Basic Research to Technology Transfer.

SOME R&D FIGURES AT UPM

BUDGET: FROM COMPETITIVE RESEARCH

PER YEAR	}	TOTAL INCOME	100 M euros
		EUROPEAN PROGRAMS	12 M euros
		R&D SPANISH PROGRAMS	12 M euros

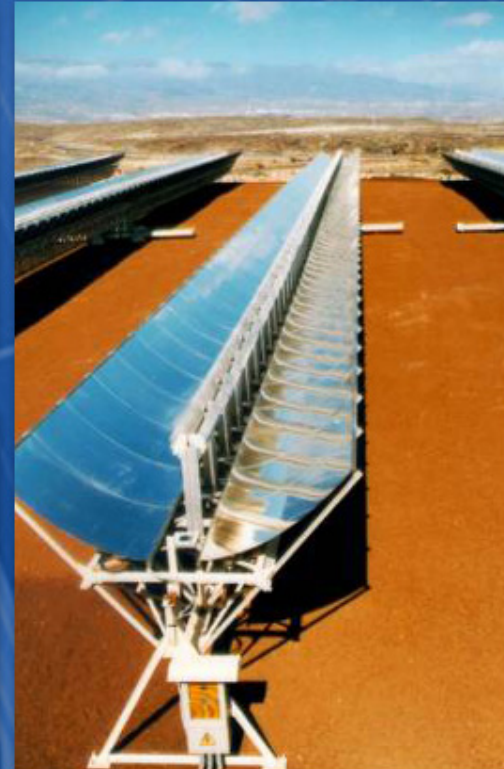
RESEARCH RESULTS

INT. JOURNAL PAPERS	1200
RESEARCH REPORTS	300
INT. CONFERENCE PAPERS	2300
DOCTORAL THESES	250

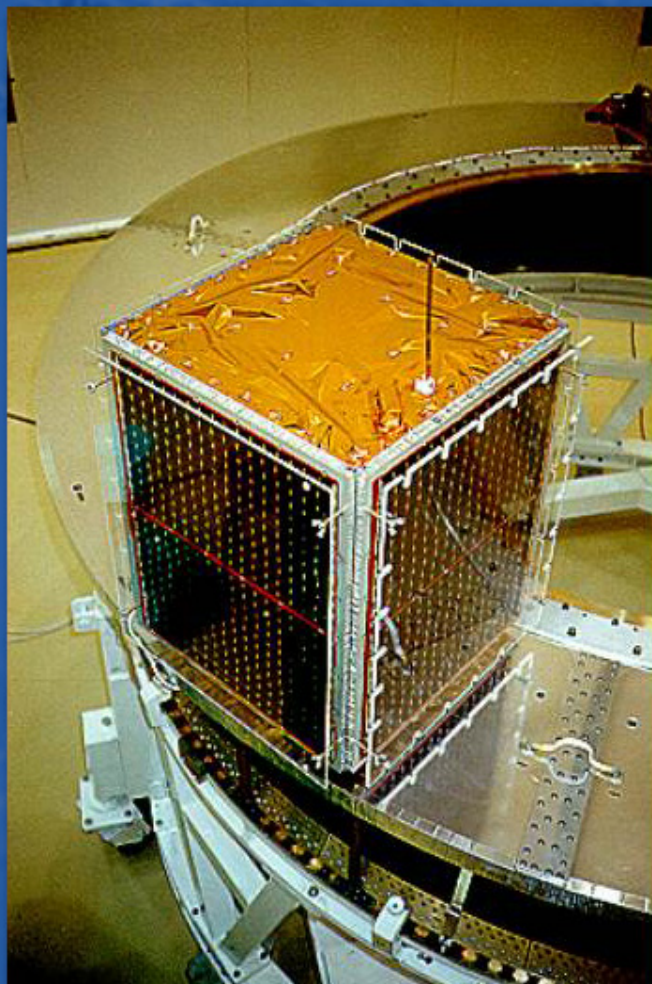


SOME
RESEARCH
EXAMPLES

SOLAR CELLS

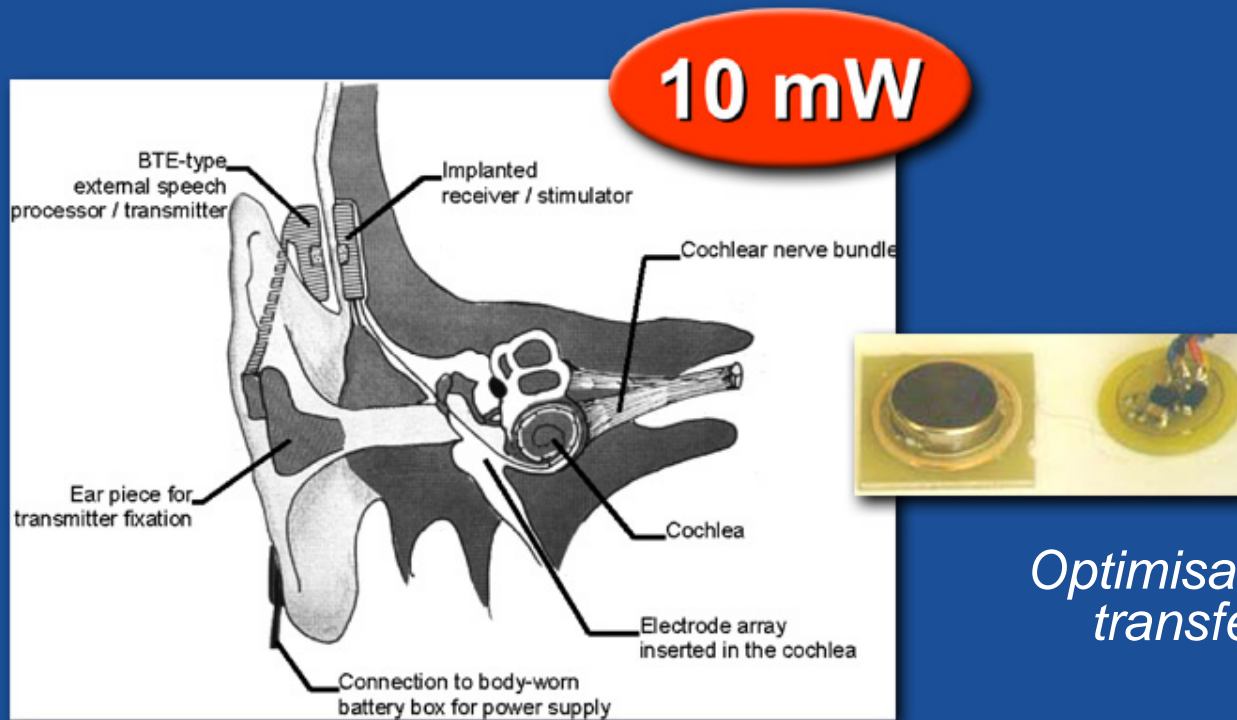


UPM SATELLITE: UPMSAT



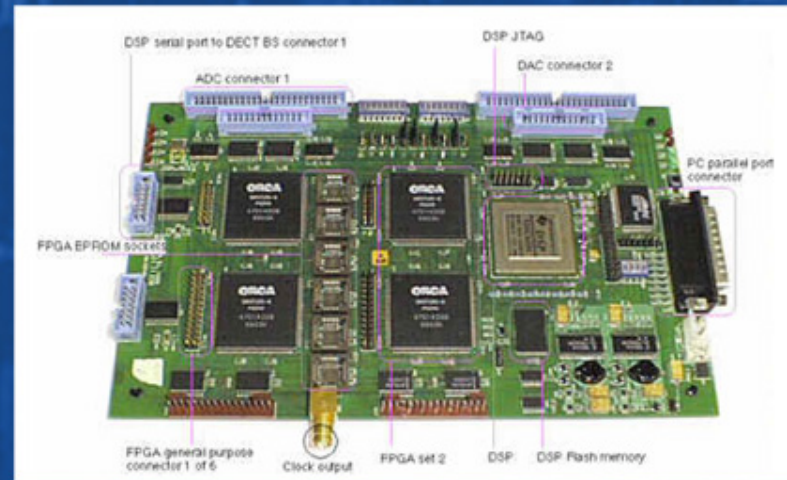
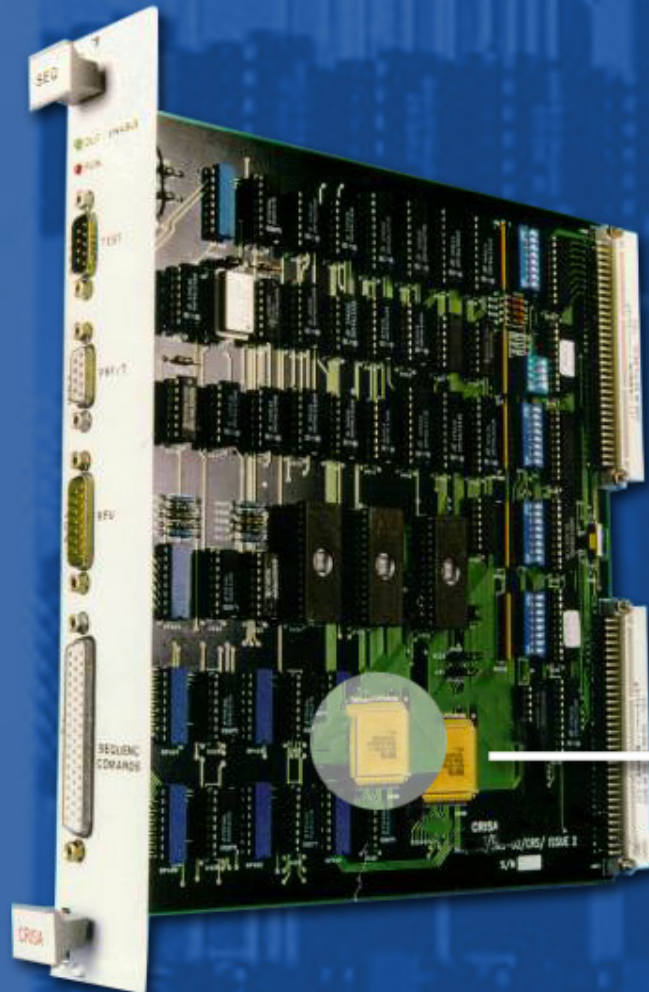
MEDICAL APPLICATIONS

Philips Hearing Implants: HELP CI *Highly efficient power link for a cochlear implant*



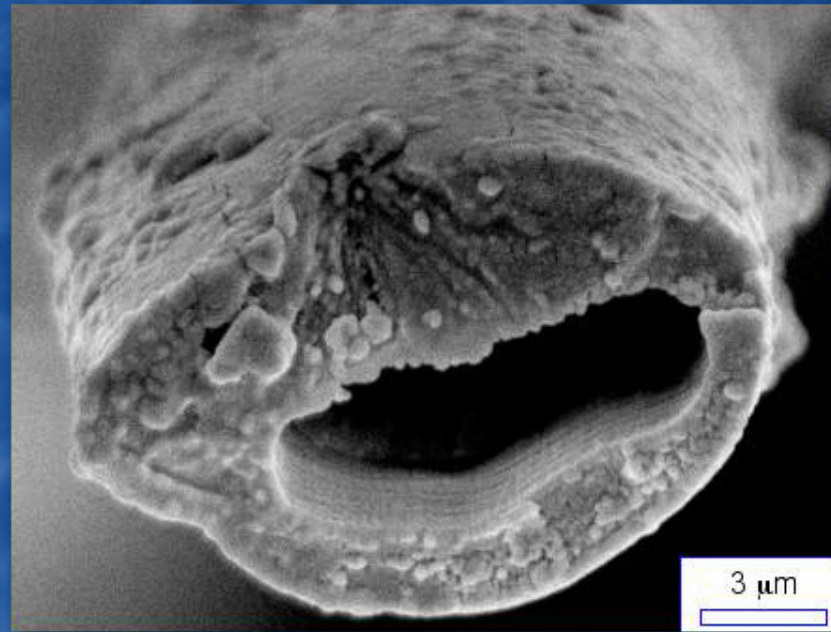
Optimisation of the power transfer in a hearing implant

MICROELECTRONICS



*Sequencer
ASIC*

MATERIALS AND NANOTECHNOLOGY



Fracture of a Silkworm's thread

AUTOMOTIVE INDUSTRY



TEST LABORATORY



INSIA

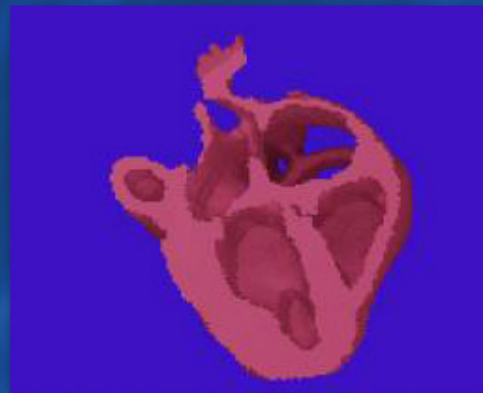
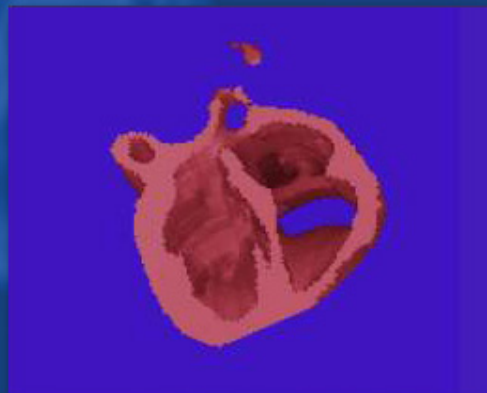
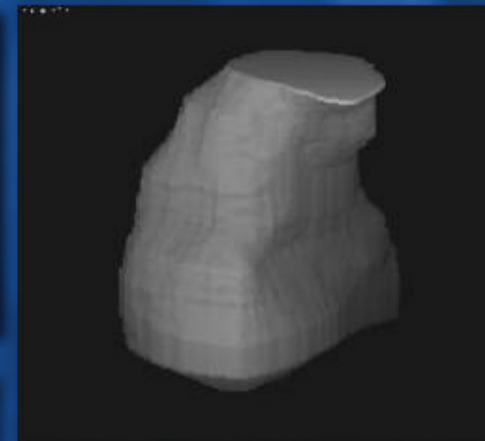
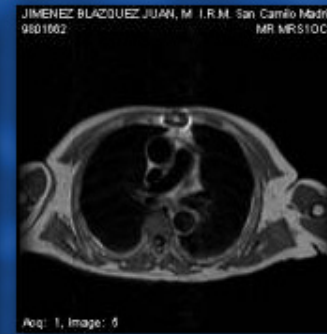
BIOTECHNOLOGY IN PLANTS



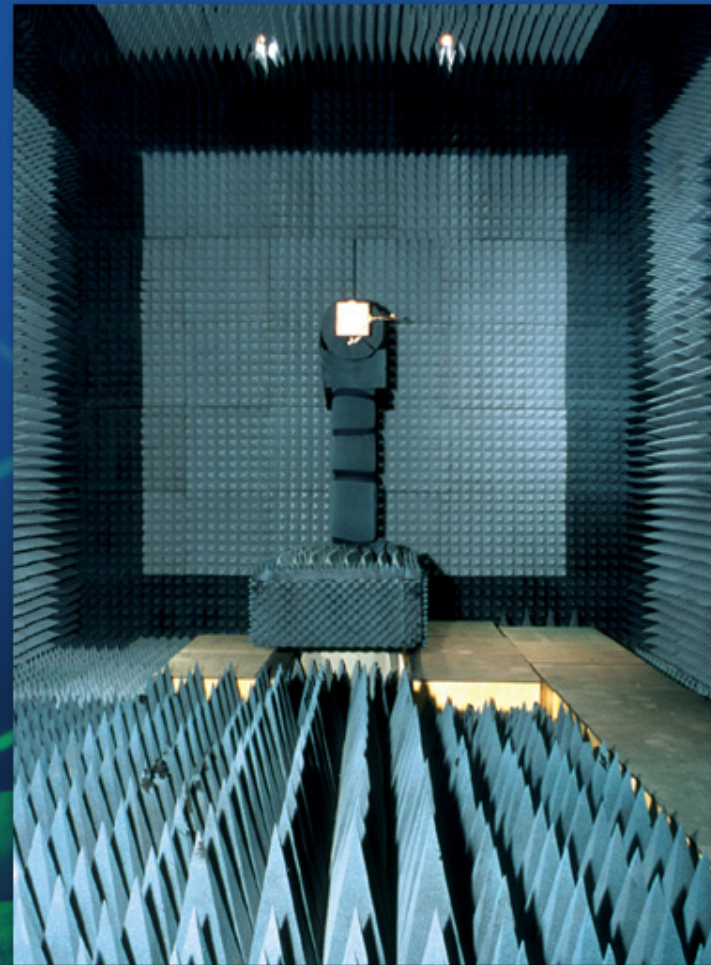
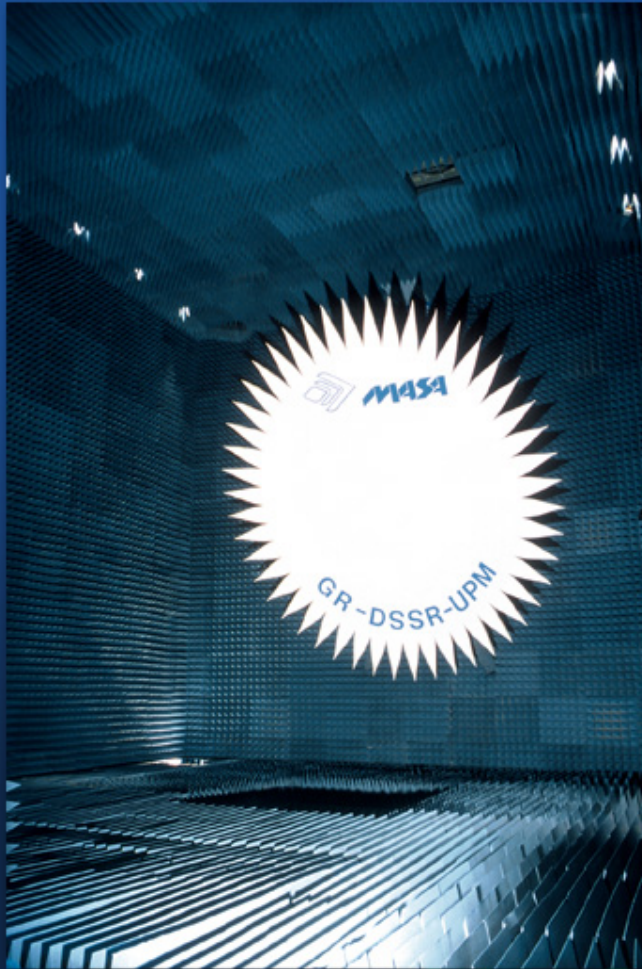
COLLABORATIVE VIRTUAL ENVIROMENT IN TELERADIOLOGY



MEDICAL IMAGING VISUALIZATION AND RECONSTRUCTION



ELECTROMAGNETIC CHARACTERIZATION



ANTENNAE IN LARGE ANECHOIC CHAMBERS

SOLAR DECATHLON CONTEST

- To build an energy autonomous **SOLAR HOUSE** of 500 sq feet
- Organized by **US DoE** to take place in Washington DC, OCT. - 05
- **19 Universities** participating (16 USA, 1 CAN, 1 PUR, 1 ESP)
- **UPM** is the only university outside north america in the contest
- Multidisciplinary project carried out only by **students**
- Involving architects and industrial, energy, and telecom engineers

