



POLITECNICO
MILANO 1863

SCUOLA DI INGEGNERIA
INDUSTRIALE E DELL'INFORMAZIONE

Master of Science in **ELECTRONICS ENGINEERING**

May 27th, 2020

www.elettronica.polimi.it



- **Politecnico di Milano: Schools and Masters**



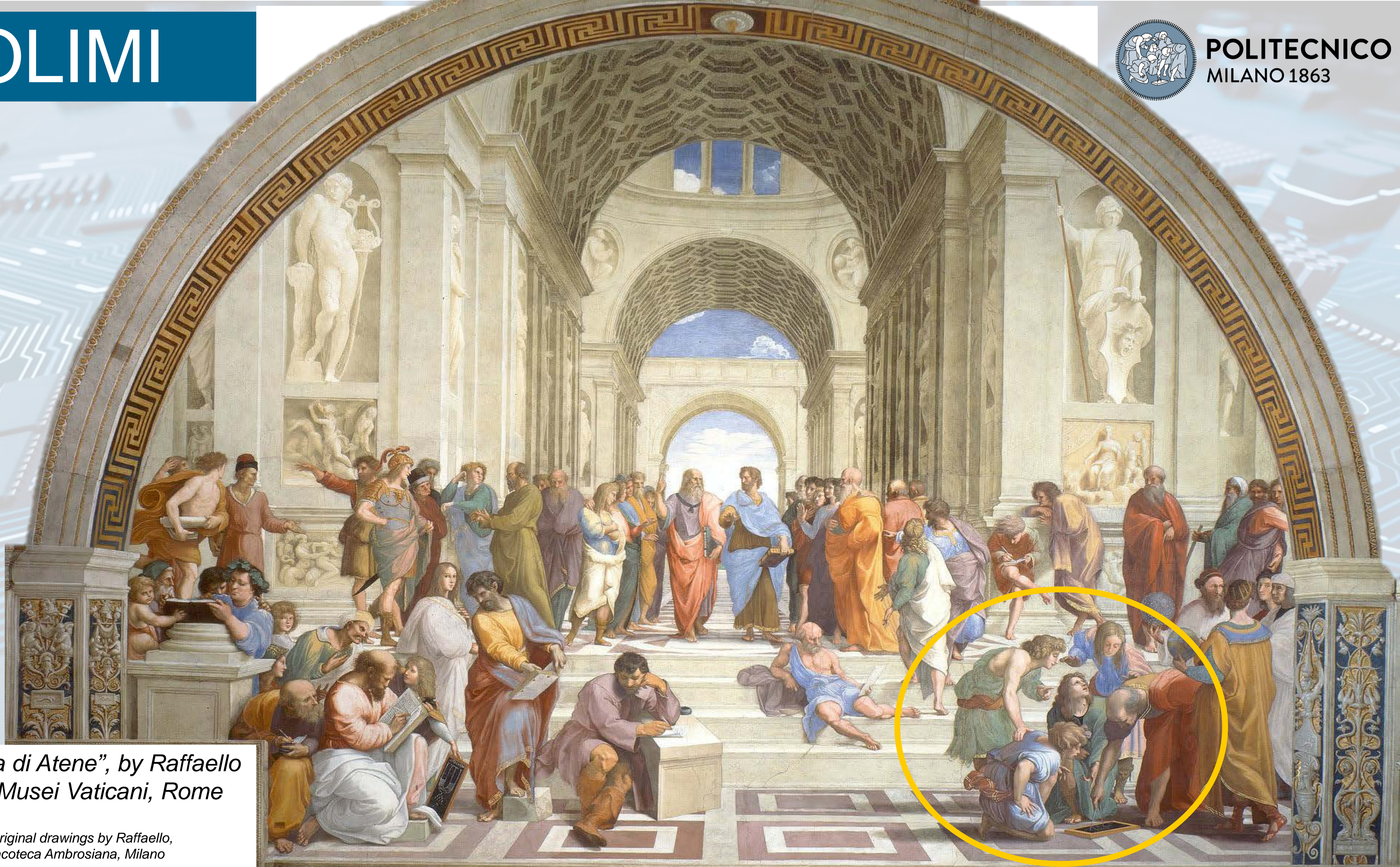
- Electronics and Engineering: what and why?



- Master Degree in Electronics Engineering



- Data and Stats



“La Scuola di Atene”, by Raffaello Sanzio, Musei Vaticani, Rome

and original drawings by Raffaello, Pinacoteca Ambrosiana, Milano



1.300 academics e
1.200 technicians and clerks

45.000 students

4 Schools/Faculties:

- Architecture, Urban Planning & Construction Engineering
- Design;
- Civil, Environmental & Land Management Engineering;
- **Industrial and Information Engineering**

12 Departments:

- ... **DEIB** ...

7 Campuses:

- ... **"MI Leonardo"** ...

Ranking:

#1 Italy,
#6 Europe,
#16 World

(in «*Engineering & Technology*»
QS World University Ranking 2019)

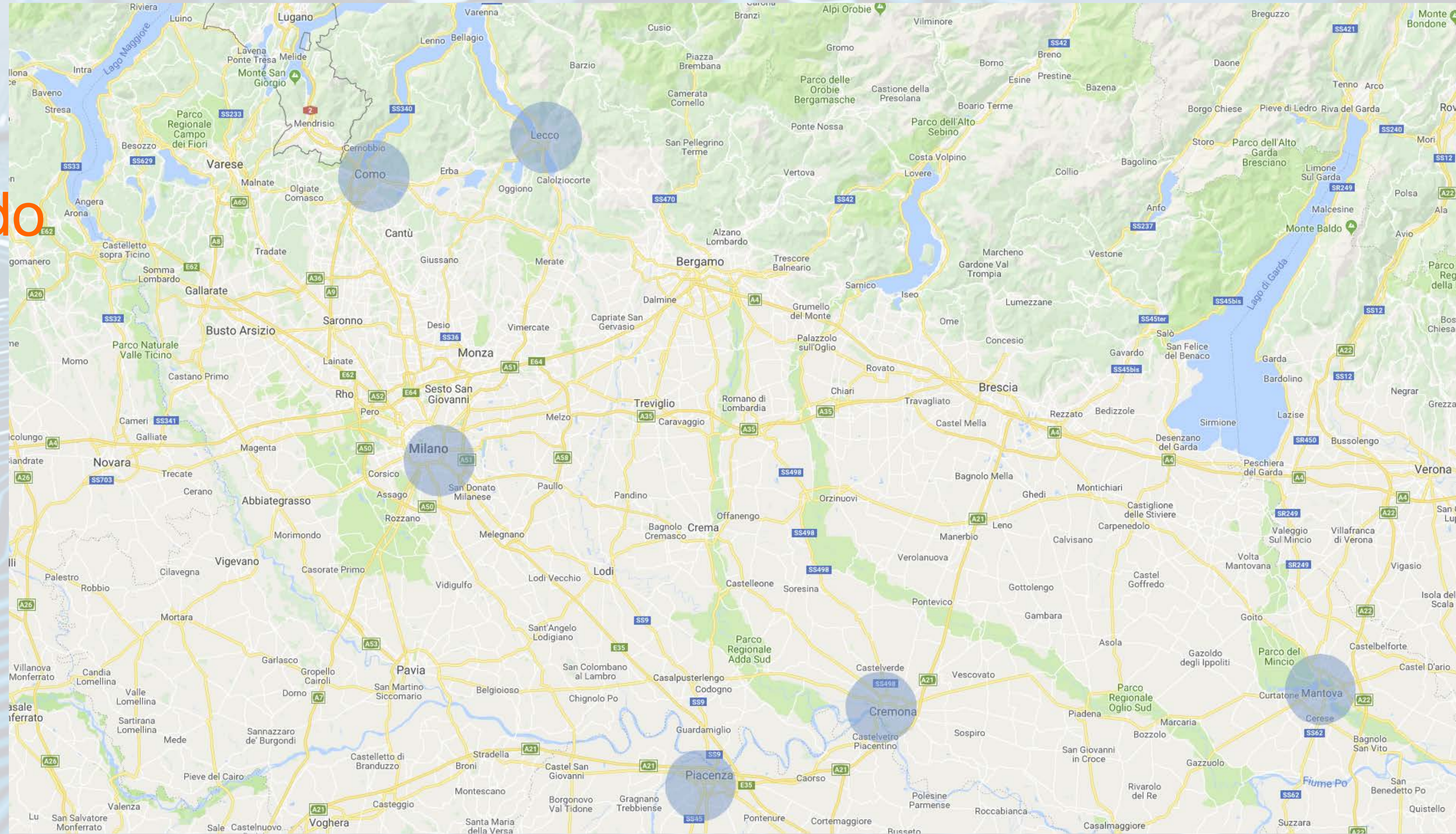
POLIMI ranks as the top university in Italy for Engineering and Technology, and among the best all over the world

POLIMI campuses



POLITECNICO
MILANO 1863

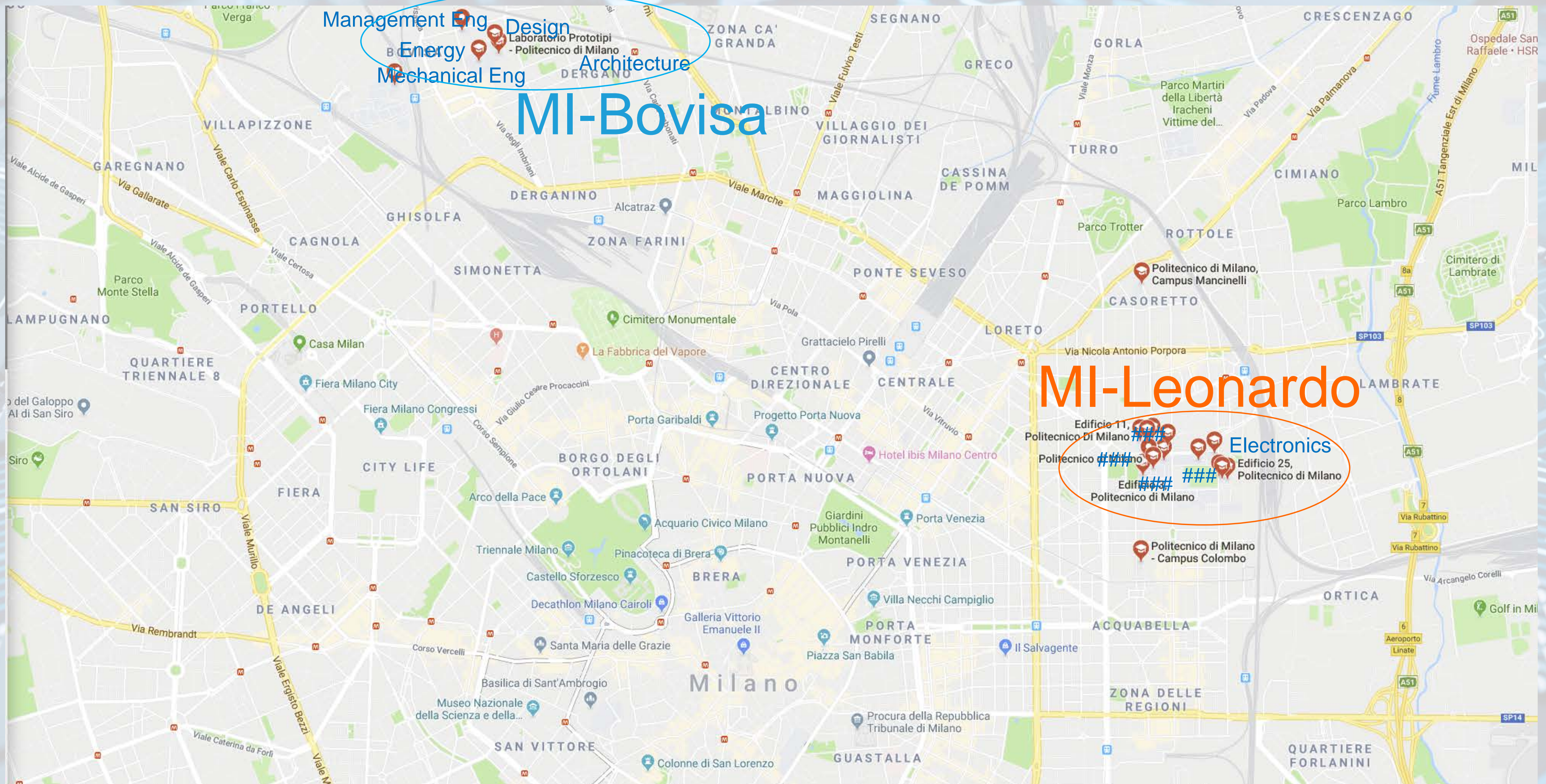
MI Leonardo
MI Bovisa
Cremona
Lecco
Mantova
Piacenza



POLIMI campuses in Milano



POLITECNICO
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Management Eng
Design
Energy
Mechanical Eng
Architecture

MI-Bovisa

MI-Leonardo

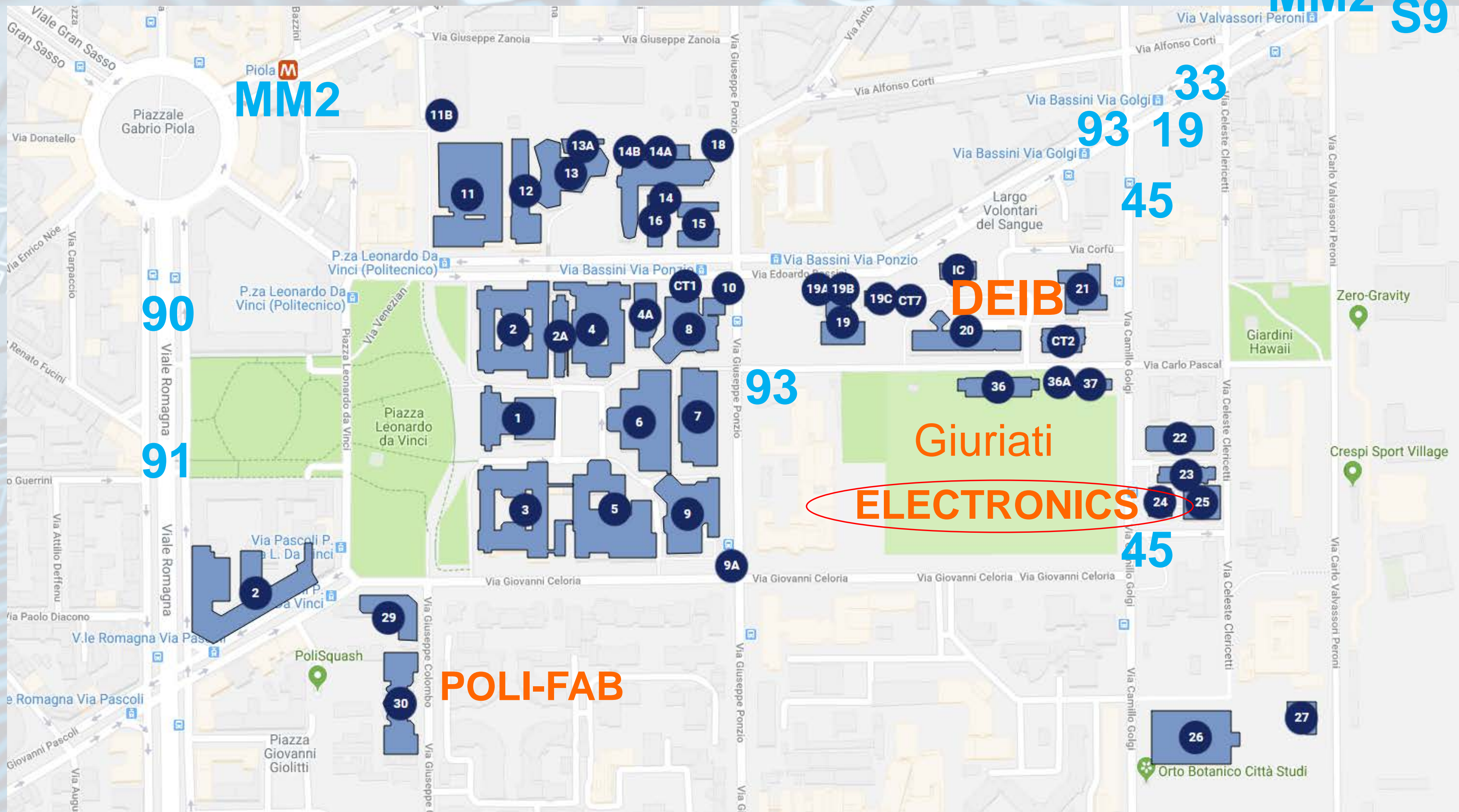
Edificio 11, Politecnico di Milano
Politecnico di Milano
Edificio 25, Politecnico di Milano
Edificio 33, Politecnico di Milano
Electronics

"MI Leonardo" Campus



POLITECNICO
MILANO 1863

MM2 S9



"MI Leonardo" POLIMI campus



POLITECNICO
MILANO 1863

ELETTRONICA
(Building 24, v. Golgi 40)

DEIB
(Building 20)

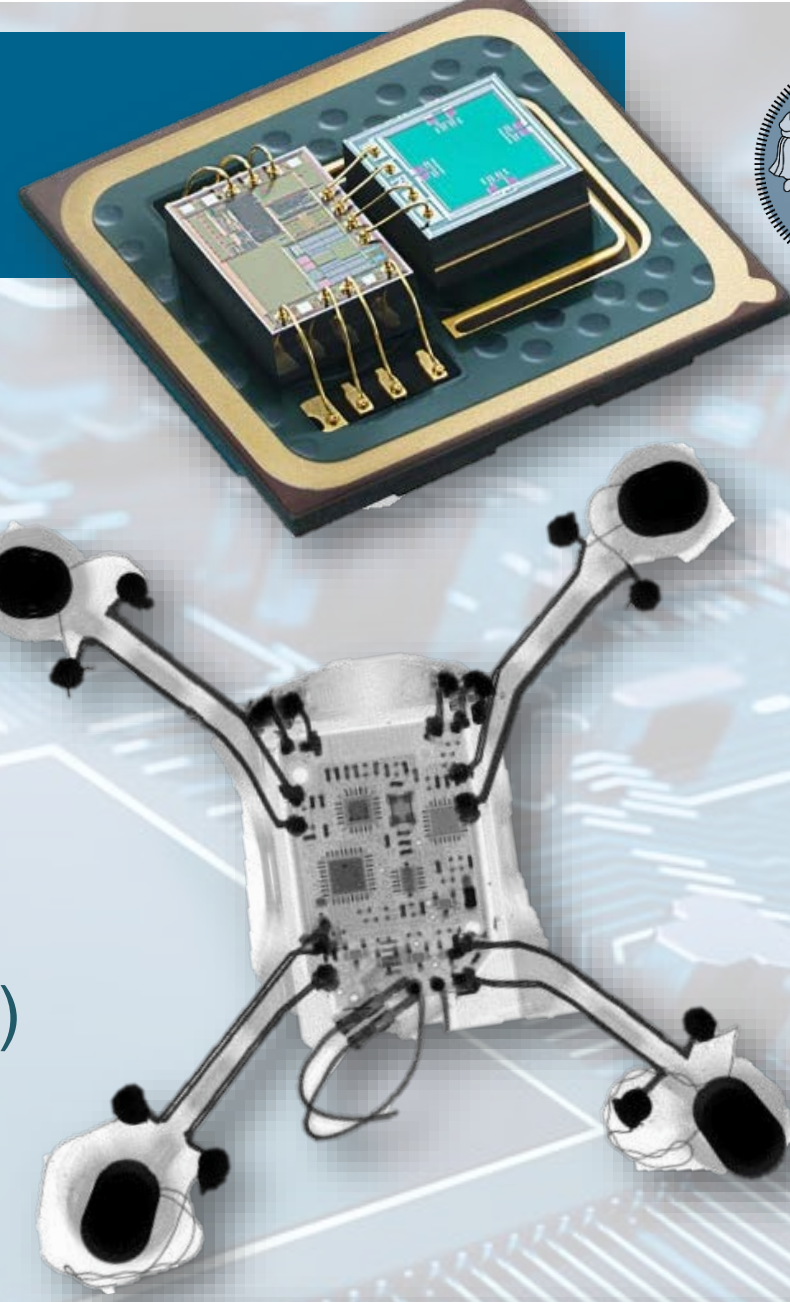
Piazza LEONARDO DA VINCI



Departments (research tasks)

12 Departments (Head of Dept.)

Dept. ARCHITECTURE & URBAN STUDIES	(DASTU)
Dept. ARCHITECTURE, BUILDINGS & CONSTRUCTIONS	(DABC)
Dept. CHEMISTRY, MATERIALS & CHEMICAL ENG "GIULIO NATTA"	(DCMC)
Dept. DESIGN	(DESIGN)
Dept. ELECTRONICS, INFORMATION AND BIOENGINEERING	(DEIB)
Dep. ENERGY	(DENG)
Dept. PHYSICS	(DFIS)
Dept. CIVIL AND ENVIRONMENTAL ENG.	(DICA)
Dept. MANAGEMENT ENG.	(DIG)
Dept. MATHEMATICS	(DMAT)
Dept. MECHANICS	(DMEC)
Dept. AEROSPACE SCIENCE AND TECHNOLOGY	(DAER)



Schools (Faculties for education)



4 Schools (Deans) e **74 CdS** (Coordinators)

	Bachelor	Master
School of ARCHITECTURE URBAN PLANNING CONSTRUCTION ENG	3	10+1
School of DESIGN	4	7
School of CIVIL, ENVIRONMENTAL AND LAND MANAGEMENT ENG	4	4
School of INDUSTRIAL AND INFORMATION ENGINEERING	17	24
OVERALL	28	46



28 Bachelor of Science (B.S.)
46 Master of Science (M.S., graduate)
18 Philosophy Doctor (Ph.D.)



"3i" School



POLITECNICO
MILANO 1863

"Industrial and Information Engineering"

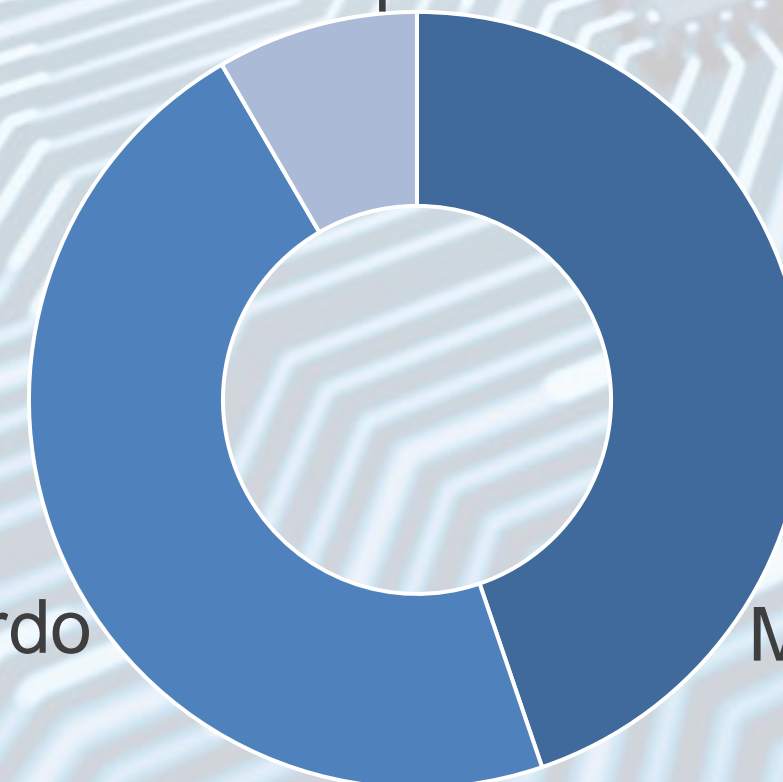
- Largest school of POLIMI
- > 5100 Bachelor degrees
- 8 Departments involved
- 917 academics and personnel

with 60% of all students
> 3500 Master degrees



≈ 22% women

other campuses 8%



MI Leonardo
47%

MI Bovisa
45%



≈ 21% international students

Info on POLIMI and "3i" School



POLITECNICO
MILANO 1863

www.polimi.it

www.ingindinf.polimi.it

The screenshot shows the Politecnico Milano website homepage. At the top left is the Politecnico Milano logo. The navigation bar includes 'MENU', 'INFO FOR', 'TOOLS', 'SEARCH', and 'LANGUAGES'. A 'login' button is in the top right. The main banner features a young man with a backpack holding folders, with the text 'OPEN DAYS 2020 LAUREE MAGISTRALI (EQUIVALENT TO MSC)' and a 'MORE' button. Below the banner is a 'SPOTLIGHT' section with a row of dots. Four news items are displayed in a grid, each with a thumbnail image, a title, and a 'more' button.

OPEN DAYS 2020 LAUREE MAGISTRALI (EQUIVALENT TO MSC)

SPOTLIGHT

- STUDENTS**
ISEE AND 2ND FEES INSTALMENT
Extension of the deadlines
- STUDENTS**
SUMMER SCHOOL IDEA LEAGUE
The 2020 Call is available
- RESEARCH & INNOVATION**
EUROPEAN PRIZE TO RESTORATION OF BASILICA OF SANTA MARIA DI COLLEMAGGIO
Politecnico di Milano took part in the European Heritage Awards / Europa Nostra 2020's winning project
- STUDENTS**
POLIPRINT AND POLITECNICO OFFICIAL MERCHANDISE REOPEN
Poliprint and Politecnico Official Merchandise, the printing service and official merchandise of the Politecnico

The screenshot shows the website for the School of Industrial and Information Engineering at Politecnico Milano. The header includes the school logo and name, and language options 'ita | eng'. A navigation bar has 'HOME', 'SCHOOL', 'TEACHING', and 'STUDENTS'. The main banner features a close-up of electronic components with the text 'SCHOOL OF INDUSTRIAL AND INFORMATION ENGINEERING'. Below the banner is a 'NEWS' section with a list of news items and an 'all news' button. On the right side, there are icons for 'On line services', 'Beep', and 'Library'. The footer contains 'CONTACTS', 'MAPS AND BUILDING', 'FAQ', and social media icons for YouTube, Twitter, Facebook, and Instagram.

SCHOOL OF INDUSTRIAL AND INFORMATION ENGINEERING

NEWS

- Final examination dates: lectures suspension
- BSc programmes 1st year 2018/2019: change of campus (Computer Science, Electronics, Automation and c...)
- Trouble ticketing system
- Bandi Double Degrees interni - Outcome of the selection process - Firts screening
- Bandi Double Degrees interni (doppie Lauree Magistrali) A.A. 2016-17
- New Master of Science Degree in Geoinformatics Engineering

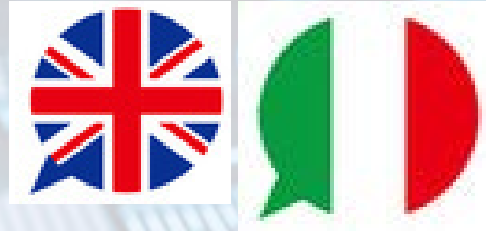
all news

Study Programme



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PhD

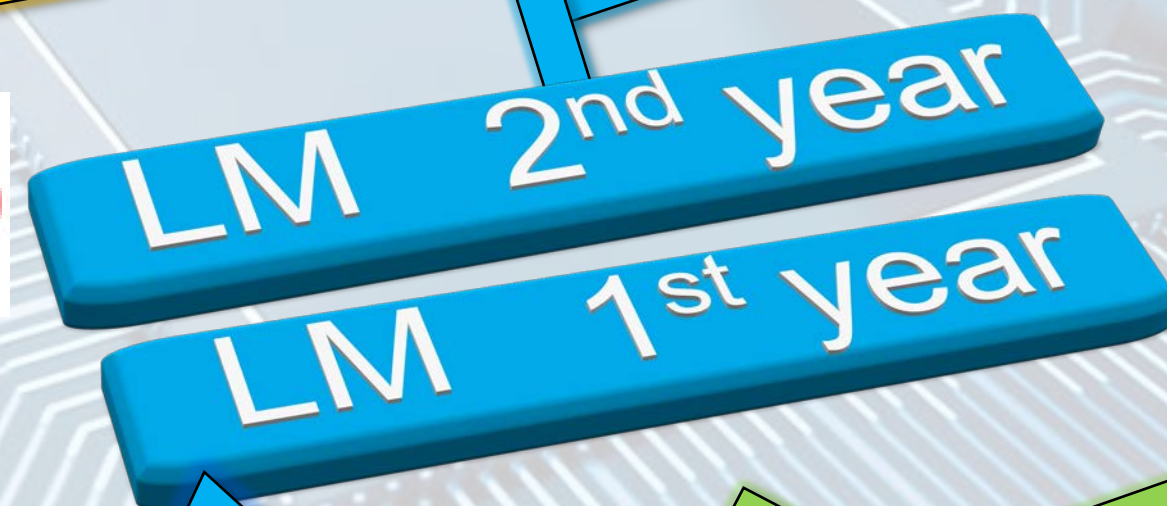
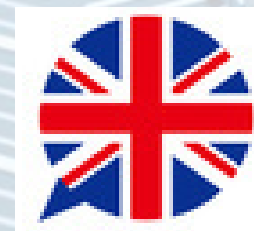


**“Master degree” and
job or R&D**



from other Italian Masters and worldwide Masters

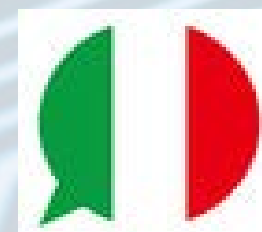
Master



**“Bachelor
degree”
and job**

from other Italian Bachelors and worldwide Bachelors

Bachelor



Masters of Science in "3i"



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"MI Leonardo" Campus

AUTOMATION and CONTROL eng.

BIOMEDICAL eng.

CHEMICAL eng.

COMPUTER SCIENCE and eng.

ELECTRICAL eng.

ELECTRONICS eng.

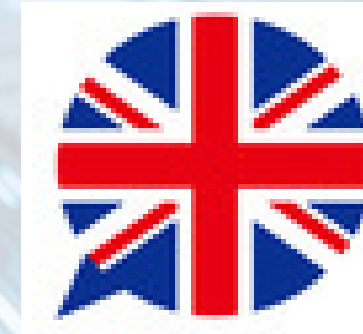
GEOINFORMATICS eng.

PHYSICS eng.

MATERIALS eng. and NANOTECHNOLOGY

MATHEMATICAL eng.

TELECOMMUNICATION eng.



"MI Bovisa" Campus

AERONAUTICAL eng.

DESIGN & eng.

ELECTRICAL eng.

ENERGY eng.

MANAGEMENT eng.

MANAG. of BUILT ENVIRON.

MECHANICAL eng.

MOBILITY eng.

NUCLEAR eng.

SPACE eng.

New Masters

BIOINFORMATICS for COMPUTATIONAL GENOMICS

CYBER RISK STRATEGY AND GOVERNANCE

FOOD eng.

MUSIC and ACOUSTING eng.

Info on Masters of Science



**POLITECNICO
MILANO 1863**

www.polimi.it/corsi/corsi-di-laurea-magistrale

POLITECNICO DI MILANO PROGRAMMES

Politecnico di Milano offers study programmes at all levels (bachelor, master of science, specializing masters and postgraduate programmes, Ph.D.) in Architecture, Design and Engineering. You can also find: high-level training courses (high-level and specialization schools, honours programmes); a wide range of MOOCs, online courses free and open to everybody, available at the Polimi Open Knowledge website; for current students, "Passion in Action" catalogue (open participation teaching activities) and language courses.

- LAUREA (EQUIVALENT TO BACHELOR OF SCIENCE)
- LAUREA MAGISTRALE (EQUIVALENT TO MASTER OF SCIENCE)**
- PROGRAMMES IN COLLABORATION WITH OTHER UNIVERSITIES
- SPECIALIZING MASTERS AND POSTGRADUATE PROGRAMMES
- RESEARCH DOCTORATE (PH.D.)

POLITECNICO MILANO 1863

Home / Programmes / Laurea Magistrale (equivalent to Master of Science)

LAUREA MAGISTRALE (EQUIVALENT TO MASTER OF SCIENCE)

Next year's educational offer for international prospective students is available at [this page](#).

SCHOOL: SCHOOL OF INDUSTRIAL AND INFORMATION ENGINEERING | CAMPUS: 2019/2020 | 2018/2019 | 2017/2018

Results: 24

- Aeronautical Engineering (Milano Bovisa)
- Automation and Control Engineering (Milano Leonardo)
- Biomedical Engineering (Milano Leonardo)
- Chemical Engineering (Milano Leonardo)
- Computer Science and Engineering (Milano Leonardo)
- Design & Engineering (Milano Bovisa)
- Electrical Engineering (Milano Leonardo, Milano Bovisa)
- Electronics Engineering (Milano Leonardo)**
- Energy Engineering (Milano Bovisa, Piacenza)
- Engineering Physics (Milano Leonardo)
- Food Engineering (Milano Leonardo)
- Geoinformatics Engineering (Milano Leonardo)
- Management Engineering (Milano Bovisa)
- Management of Built Environment (Milano Leonardo)
- Materials Engineering and Nanotechnology (Milano Leonardo)
- Mathematical Engineering (Milano Leonardo)
- Mechanical Engineering (Milano Bovisa, Piacenza)
- Mechanical Engineering (Lecco)
- Mobility Engineering (Milano Bovisa)
- Music and Acoustic Engineering (Cremona)
- Nuclear Engineering (Milano Bovisa)
- Safety and Prevention Engineering in the Process Industry (Milano Leonardo)
- Space Engineering (Milano Bovisa)
- Telecommunication Engineering (Milano Leonardo)

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Home / Programmes / Laurea Magistrale (equivalent to Master of Science) / Details

ELECTRONICS ENGINEERING

2° (Corso di Laurea Magistrale - Equivalent to Master of Science)

LEVEL: 2

CAMPUS: Milano Leonardo

LANGUAGE: English

- Educational rules Definitive**
- TRACKS AVAILABLE: PSS - ELECTRONICS ENGINEERING | Campus: Milano Leonardo
- OTHER INFORMATION:
 - Professors
 - International partners for abroad experience
 - Full programme description**

POLITECNICO MILANO 1863

manifesti

Degree programme

Programme Structure

Show/Search Programme

Save Document

Degree Programme

Read Degree Programme

Faculty

Infrastructures

Quantitative data

International context

Customized Schedule

Your customized time schedule has been disabled

Enable

Search

Search a Professor

Search a Course

Search a Course (system prior D.M. n. 509)

Search Lessons taught in English

Glossary

Semester (Sem)

1 First Semester

2 Second Semester

A Annual course

Course type (Type)

I Integrated Course

M Mono-Disciplinary Course

V Final Examination

Language

Course completely offered in italian

Course completely offered in english

Course offered in italian and english

Not available

Innovative teaching

The credits shown next to this symbol indicate the part of the course CFUs provided with Innovative teaching. These CFUs include:

- Subject taught jointly with companies or organizations
- Blended Learning & Flipped Classroom
- Massive Open Online Courses (MOOC)
- Soft Skills

Show/Search Programme

Academic Year: 2019/2020 | Sede: All campuses

School: School of Industrial and Information Engineering (225)

Programme: Electronics Engineering (476)

Programme Year: All | Track: PSS - ELECTRONICS ENGINEERING Campus: Milano Leonardo Language: English

Refresh

General informations (Show >>)

1st Year

Code	SSD	Course Title	Num Sec	Language	Course location	Type	Sem	CFU	CFU Group
052427	ING-INF/01	ANALOG CIRCUIT DESIGN		English	MI	M	1	10.0 [1.0 @]	10.0
054654	ING-INF/01	ELECTRONIC SYSTEMS		English	MI	M	1	10.0	10.0
095155	ING-INF/01	ELECTRON DEVICES		English	MI	M	1	10.0	10.0
095162	ING-INF/01	MEMS AND MICROSENSORS		English	MI	M	1	10.0	10.0
095251	ING-INF/01	SIGNAL RECOVERY		English	MI	M	2	10.0	10.0
095264	ING-INF/01	DIGITAL INTEGRATED CIRCUIT DESIGN		English	MI	M	2	10.0	10.0
095274	ING-INF/01	RF CIRCUIT DESIGN		English	MI	M	2	10.0	10.0
054081	ING-INF/01	MICROELECTRONIC TECHNOLOGIES		English	MI	M	2	5.0 [1.0 @]	5.0
054083	ING-INF/01	DIGITAL ELECTRONIC SYSTEMS DESIGN		English	MI	M	2	5.0 [3.0 @]	5.0
--	--	Courses to be chosen from Group TAB1		--	--	--	--	--	5.0

2nd Year

Code	SSD	Course Title	Num Sec	Language	Course location	Type	Sem	CFU	CFU Group
095380	ING-INF/01	MIXED-SIGNAL CIRCUIT DESIGN		English	MI	M	1	10.0	10.0
090918	ING-INF/01	POWER ELECTRONICS		English	MI	M	1	10.0	10.0
--	--	Courses to be chosen from Group TAB1		--	--	--	--	--	10.0
054085	ING-INF/01	BIOCHIP		English	MI	M	2	5.0 [2.0 @]	5.0
095394	ING-INF/01	SEMICONDUCTOR RADIATION DETECTORS		English	MI	M	2	5.0	10.0
090935	ING-INF/01	ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUMENTATION		English	MI	M	2	10.0	10.0
--	--	Courses to be chosen from Group TAB2		--	--	--	--	--	10.0
--	--	Courses to be chosen from Group TAB1		--	--	--	--	--	10.0
090921	--	THESIS AND FINAL EXAM		--	--	V	1	20.0	20.0
090921	--	THESIS AND FINAL EXAM		--	--	V	2	20.0	20.0

Courses of the Group TAB1

Code	SSD	Course Title	Num Sec	Language	Course location	Type	Sem	CFU
052471	ING-INF/03	ADVANCED DIGITAL SIGNAL PROCESSING		English	MI	M	1	10.0 [1.0 @]
097589	FIS/03	ADVANCED OPTICS AND LASERS		English	MI	M	1	10.0
099282	BIO/10	BIOINFORMATICS AND FUNCTIONAL GENOMICS		Italian	MI	M	1	5.0
083042	ING-IND/34	CELLULAR BIOENGINEERING		Italian	MI	M	1	10.0

M.S. Descriptions and Regulations



POLITECNICO
MILANO 1863

www.polimi.it/corsi/corsi-di-laurea-magistrale

School of Industrial and Information Engineering
Electronics Engineering (Milano Leonardo) - 2019/2020

2. General presentation of the study programme

The Study Programme in Electronics Engineering prepares the student to conceive, design, innovate, validate and disseminate devices, circuits, apparatuses and complex electronic systems and to integrate them into highly multidisciplinary areas, in the most diversified applications and countless high-tech and consumer world markets.

The Study Programme in Electronics Engineering (ELN) is divided into a first-level three-year Bachelor of Science (*Laurea*, L) degree and a second-level two-year Master of Science (*Laurea Magistrale*, LM) degree, with progressively increasing contents and skills. The *Laurea Magistrale* in Electronics Engineering (LM ELN) is equivalent to the Master of Science in Electronics Engineering (M.S.E.E.).

The aim of the LM ELN is to train and complete professional Electronics Engineers with a broad and robust scientific, technological and engineering know-how, so that they acquire the capability of combining the physical-chemical-mathematical aspects of the most advanced sciences with the technological needs of advanced engineering implementations. The LM ELN provides the skills to create enabling technologies, demonstrate innovative applications, design cutting-edge electronic products and systems, integrate them in the most diverse areas, often expanding toward new markets and scenarios, by inventing new fields, and by improving the quality of everyday life.

Electronics is everywhere around us and it is the irreplaceable and enabling basis of all current and future technologies of the Information, Communication, Control, Automation, Energy and Electricity era. Scientific researches and market developments in electronic technologies are continuous, incessant, and increasingly stimulated by the most diverse and demanding applications. For example, ever-faster microprocessors, with low power consumption, but higher and higher computing power, and increasingly dense memories, without defects and of long endurance and short access time, are the essential electronic constituents of any computer and processing system; without such electronic circuits, artificial intelligence would remain only science-fiction. The ultra-sensitive and miniaturized semiconductor sensors, which continually dialogue with each other and towards the outside world, in the most refined robotic systems and in distributed and ubiquitous networks, are fundamental to acquire the real world's signals, understand them, manage them, control them, and implement actions; without such electronic devices, reality would remain only virtual. Electronic devices, from the simplest consumer products of entertainment and gaming to advanced electronic systems for automation and control, communications, information systems, biomedical instrumentation, equipment for energy generation, storage and distribution, avionics, mechatronics and satellite systems, and so on, have become so fundamental that their existence and performance are taken for granted; without such electronic systems there would be no modern world.

Thanks to the success of the LM ELN and the excellence of Electronics Engineers, the design and innovation of electronic devices, electronic circuits, electronic equipment and systems will provide the fundamental building blocks for all areas of modern life, with all its "Smart-" (smart cyber-physical-systems, smart industries, smart manufacturing, smart living, smart mobility, smart lighting, smart cities, smart communities, smart aging, etc.) and "autonomous-" (vehicles, driving, fleet, manufacturing, etc.) features, so invasive in everyday life.

The Master of Science's Electronics Engineer is the inventor of these systems, she/he designs them, develops them, validates them experimentally and eventually installs them into the end-user application. The first task of an Electronics Engineer is to derive models of the physical reality with which his/her electronic systems will interact, to understand, describe, foresee, and verify the interactions with the other mechanical, electrical, energetic, informative, biological, clinical, physical, chemical, nuclear, etc. equipment. It is a refined and multifaceted professional figure, not closed in his world, but oriented to a continuous interaction with the users of these systems. The Electronics Engineer has a propulsive push towards innovation aimed at improving the performance not only of what is electronic-based (e.g., the component, board, instrument, mainframe,

Data: 23/Mar/2019

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School of Industrial and Information Engineering
Electronics Engineering (Milano Leonardo) - 2019/2020

- PROJECTS to train students to put skills into practice;
- CONTESTS between students and with companies.

As shown in the guidelines for the second-level *Laurea Magistrale* in Electronics Engineering, seven courses offer a total of 12 credits of D.I. Action 1; these are indicated in the following tables with the symbol "d.i." and the number of corresponding credits out of the total number of credits assigned to the course (e.g. the "2.0 d.i." of the "Biochip" subject at the second year, out of the 5 credits total).

Furthermore, in the next academic years other forms of D.I., both in the form of Action 1 and Action 2 activities, will be activated, to allow students to acquire other "soft skills", in addition to technological and scientific knowledge, aimed at improving both public speaking and interactive presentation of achieved results (e.g. the progress of on-going studies or projects), organizational skills, team building and effective teamwork interactions.

Code	Act type	SSD	Course Title	Language	Type	Sem	CFU	CFU Group
052427	B	ING-INF/01	ANALOG CIRCUIT DESIGN	EN	M	1	10.0 [1.0 d.i.]	10.0
054654	B	ING-INF/01	ELECTRONIC SYSTEMS	EN	M	1	10.0	10.0
095155	B	ING-INF/01	ELECTRON DEVICES	EN	M	1	10.0	10.0
095162	B	ING-INF/01	MEMS AND MICROSENSORS	EN	M	1	10.0	10.0
095251	B	ING-INF/01	SIGNAL RECOVERY	EN	M	2	10.0	10.0
095264	B	ING-INF/01	DIGITAL INTEGRATED CIRCUIT DESIGN	EN	M	2	10.0	10.0
095274	B	ING-INF/01	RF CIRCUIT DESIGN	EN	M	2	10.0	10.0
054081	B	ING-INF/01	MICROELECTRONIC TECHNOLOGIES	EN	M	2	5.0 [1.0 d.i.]	5.0
054083	B	ING-INF/01	DIGITAL ELECTRONIC SYSTEMS DESIGN	EN	M	2	5.0 [3.0 d.i.]	5.0
--	--	--	Courses to be chosen from Group TAB1	--	--	--	--	5.0

Legend for the "Training Activities" column: "B" are core-course on characterizing Electronics subjects; "C" are side-courses, i.e. not strictly related to Electronics topics. The more specific, core-courses are those belonging to the specific Scientific Disciplinary Sectors (SSD) "ING-INF / 01 - ELECTRONICS" and also "ING-INF / 02 - Electromagnetic Fields" and "ING-INF / 07 - Electrical Measurements and Electronics".

The 10 credits "ANALOG CIRCUIT DESIGN" core-course provides also 1 credit of Innovative Education (D.I. indicated with "1.0 d.i." in the tables) consisting of lessons delivered with active teaching methods in which the students are asked to answer interactively to questions posed in classroom and at the end of the lessons and by contents addressed in flipped-class mode.

The 5 credits "DIGITAL ELECTRONIC SYSTEM DESIGN" core-course provides 3 credits of D.I. consisting of flipped-class activities with hands-on practice on developmental electronic boards employing configurable electronic FPGA (field-programmable gate-array) devices and on CAD software tools for the synthesis and simulation of programmable digital electronic systems.

The 5 credit "MICROELECTRONIC TECHNOLOGIES" core-course provides 1 credit of D.I. consisting of a multimedia MOOC (Massive Open Online Course) on some microelectronic manufacturing processing for integrated circuits and of guided tours in laboratories and production rooms of a microelectronic industry.

2 Year courses - Track: PSS - ELECTRONICS ENGINEERING

Code	Act type	SSD	Course Title	Language	Type	Sem	CFU	CFU Group
095380	B	ING-INF/01	MIXED-SIGNAL CIRCUIT DESIGN	EN	M	1	10.0	10.0

Data: 23/Mar/2019

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School of Industrial and Information Engineering
Electronics Engineering (Milano Leonardo) - 2019/2020

Code	Act type	SSD	Course Title	Language	Type	Sem	CFU	CFU Group
090918	B	ING-INF/01	POWER ELECTRONICS	EN	M	1	10.0	10.0
--	--	--	Courses to be chosen from Group TAB1	--	--	--	--	10.0
054085	B	ING-INF/01	BIOCHIP	EN	M	2	5.0 [2.0 d.i.]	10.0
095394	B	ING-INF/01	SEMICONDUCTOR RADIATION DETECTORS	EN	M	2	5.0	10.0
090935	B	ING-INF/01	ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUMENTATION	EN	M	2	10.0	10.0
--	--	--	Courses to be chosen from Group TAB2	--	--	--	--	10.0
--	--	--	Courses to be chosen from Group TAB1	--	--	--	--	10.0
090921	--	--	THESIS AND FINAL EXAM	--	V	1	20.0	20.0
090921	--	--	THESIS AND FINAL EXAM	--	V	2	20.0	20.0

The 5 credit "BIOCHIP" course provides 2 credits of D.I., consisting of a multimedia MOOC (Massive Open Online Course) on microelectronic methodologies for manufacturing electronic devices and biochips, and of some activities where students must design a biochip at the POLI-FAB clean-rooms and laboratories.

Courses of the Group TAB1

Code	Act type	SSD	Course Title	Language	Type	Sem	CFU	CFU Group
052471	C	ING-INF/03	ADVANCED DIGITAL SIGNAL PROCESSING	EN	M	1	10.0 [1.0 d.i.]	10.0
094790	C	ING-INF/03	RADAR IMAGING	EN	M	1	5.0	10.0
096129	C	ING-INF/04	ADVANCED AND MULTIVARIABLE CONTROL	EN	M	2	10.0	10.0
083047	C	ING-IND/34	BIOMATERIALS [C.I.]	IT	I	2	10.0	10.0
083042	C	ING-IND/34	CELLULAR BIOENGINEERING	IT	M	1	10.0	10.0
097589	C	FIS/03	ADVANCED OPTICS AND LASERS	EN	M	1	10.0	10.0
095942	C	ING-INF/05	DIGITAL SYSTEMS DESIGN METHODOLOGIES	EN	I	2	10.0	10.0
073011	C	ING-INF/06	BIOENGINEERING OF THE MOTOR SYSTEM	IT	M	1	5.0	10.0
099282	C	BIO/10	BIOINFORMATICS AND FUNCTIONAL GENOMICS	IT	M	1	5.0	10.0
096617	C	FIS/03	PHYSICS OF PHOTOVOLTAIC PROCESSES	EN	M	1	5.0	10.0
052351	C	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	EN	I	1	10.0	10.0
096081	C	FIS/03	QUANTUM OPTICS AND INFORMATION	EN	M	2	5.0	10.0
093062	C	ING-INF/04	AUTOMATION AND CONTROL IN VEHICLES	EN	M	2	5.0	10.0
054312	C	ING-INF/03	DIGITAL COMMUNICATION	EN	I	1	10.0 [2.0 d.i.]	10.0
088949	C	ING-INF/05	ADVANCED COMPUTER ARCHITECTURES	EN	M	2	5.0	10.0
090914	C	ING-INF/04	CONTROL OF INDUSTRIAL ROBOTS	EN	M	1	5.0	10.0
095907	C	ING-INF/05	EMBEDDED SYSTEMS	EN	I	1	10.0	10.0
096660	C	MAT/08	NUMERICAL METHODS IN MICROELECTRONICS	EN	M	2	5.0	10.0
052470	C	ING-INF/03	QUANTUM COMMUNICATIONS	EN	M	2	5.0	10.0
089480	C	FIS/03	SOLID STATE PHYSICS A	EN	M	2	5.0	10.0
096532	C	ING-IND/31	ADVANCED CIRCUIT THEORY	EN	M	2	5.0	10.0

In TAB1 there are 5 and 10 credit electives taught in Italian that students can select.

Courses of the Group TAB2

Code	Act type	SSD	Course Title	Language	Type	Sem	CFU	CFU Group
090918	B	ING-INF/01	POWER ELECTRONICS	EN	M	1	10.0	10.0

Data: 23/Mar/2019

pag. 16/20

Libraries: 4 a MI + 1 materials library + 5 in other Campus



Career Service www.careerservice.polimi.it to prepare to future jobs



POLIHUB www.polihub.it to support your ideas and to foster startups



MOOCS www.pok.polimi.it to download free online courses by POLIMI





- Politecnico di Milano: Schools and Masters



- **Electronics and Engineering: what and why?**



- Master Degree in Electronics Engineering



- Data and Stats

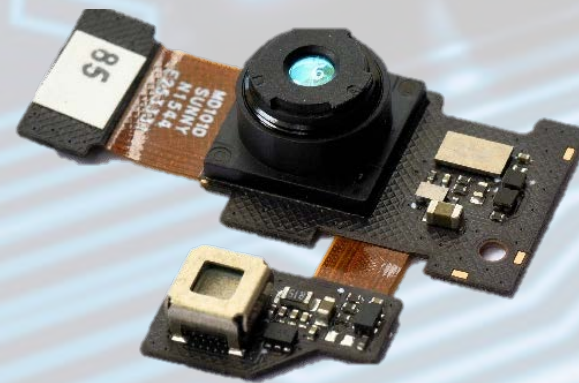
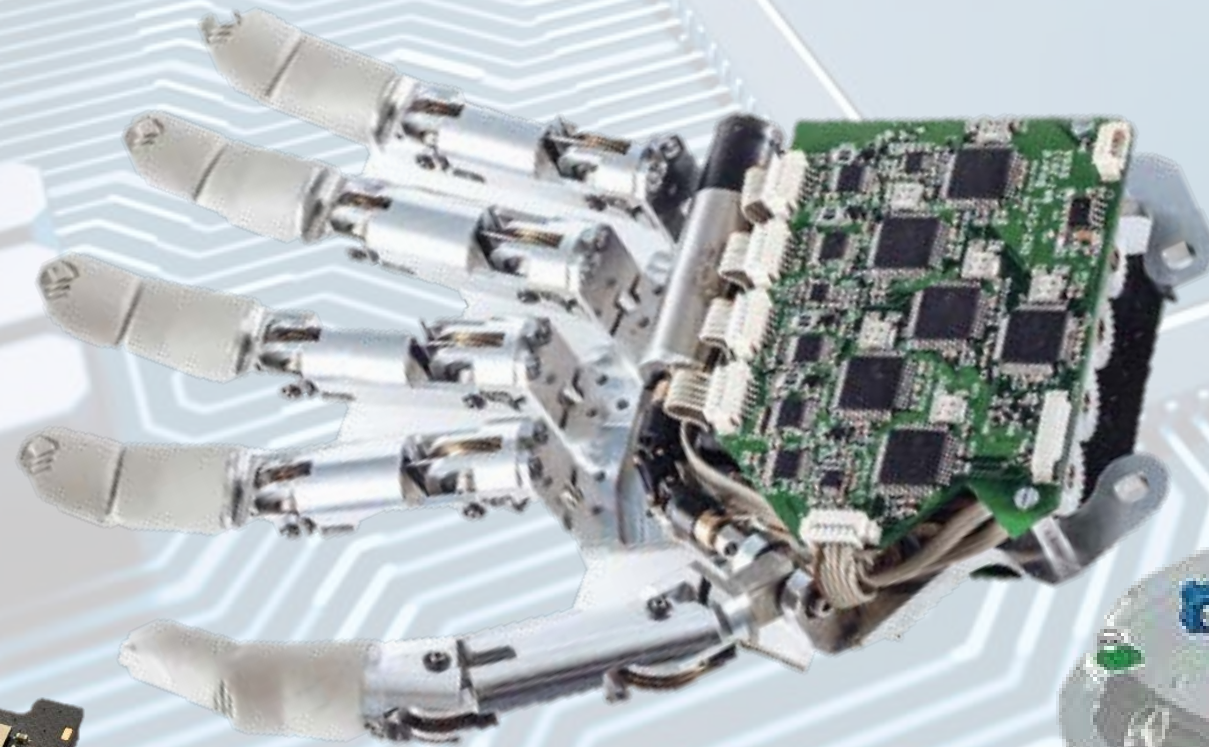
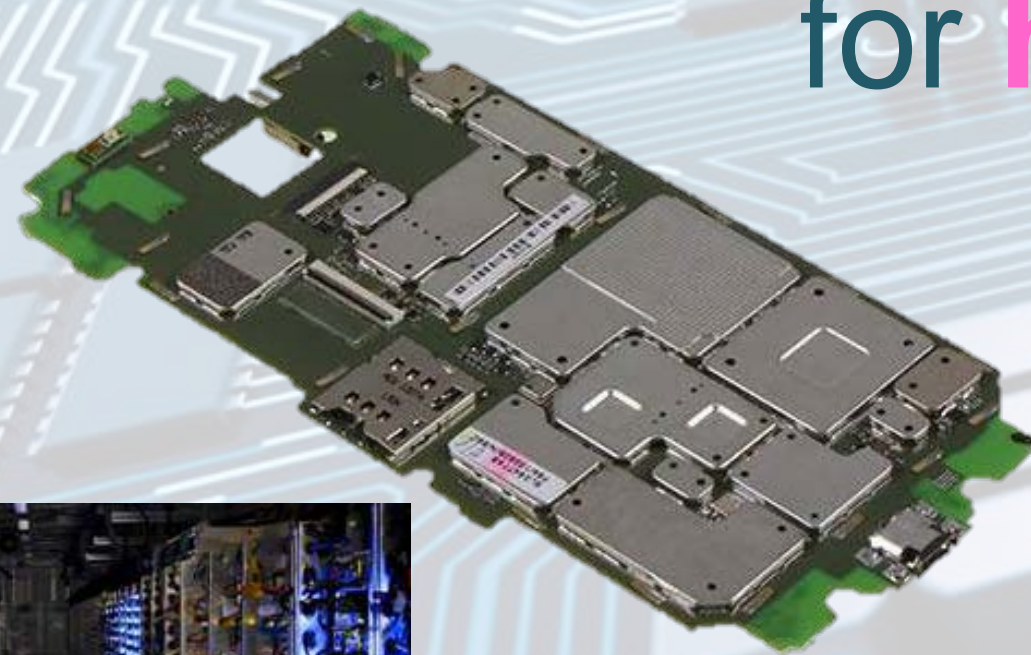
What is ELECTRONICS?



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MILANO 1863

embedded systems, smart machines, communication, networks...

smart, autonomous, wearable, "...of things" ... systems
for ***real*** and ***virtual*** worlds, and for ***augmented-reality***
for ***humans*** and ***robots*** !



Electronics is the **enabling** technology to capture real-world information, to process signals, to make actions and motion, to interact with machines, to **augment the reality** around us !

Where is ELECTRONICS?



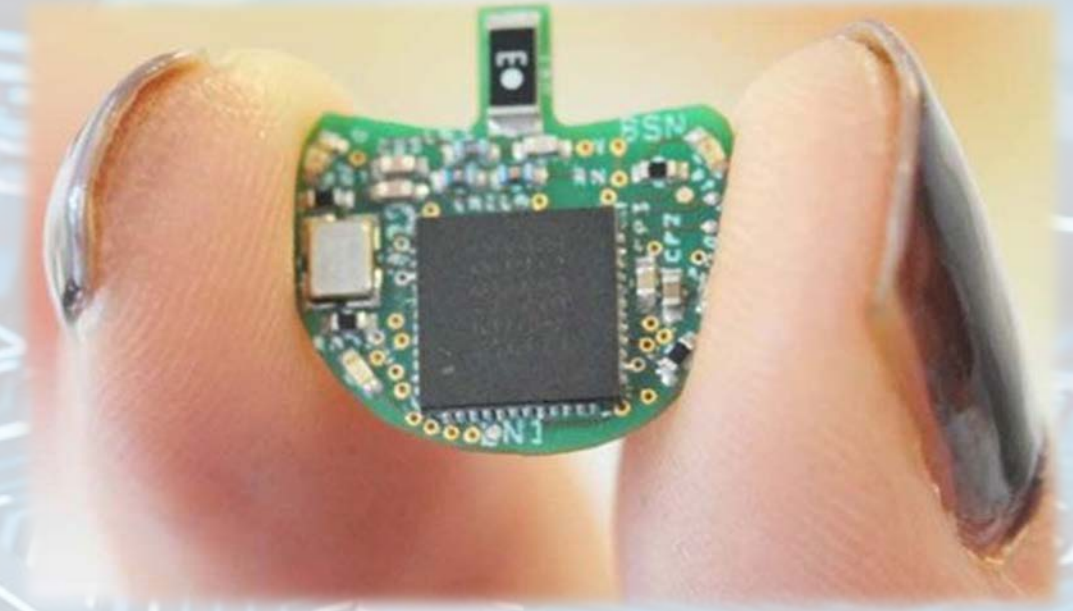
POLITECNICO
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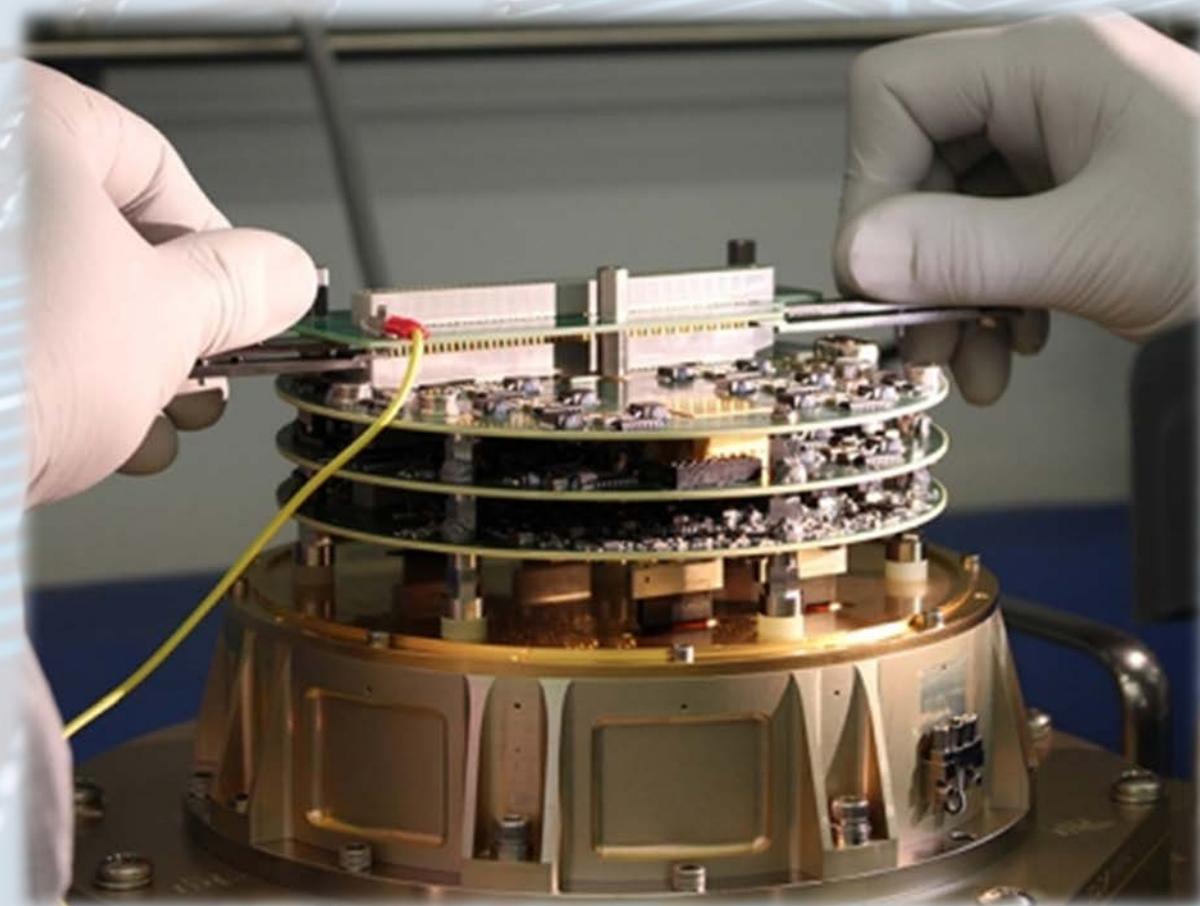
components and circuits
science, physics, space



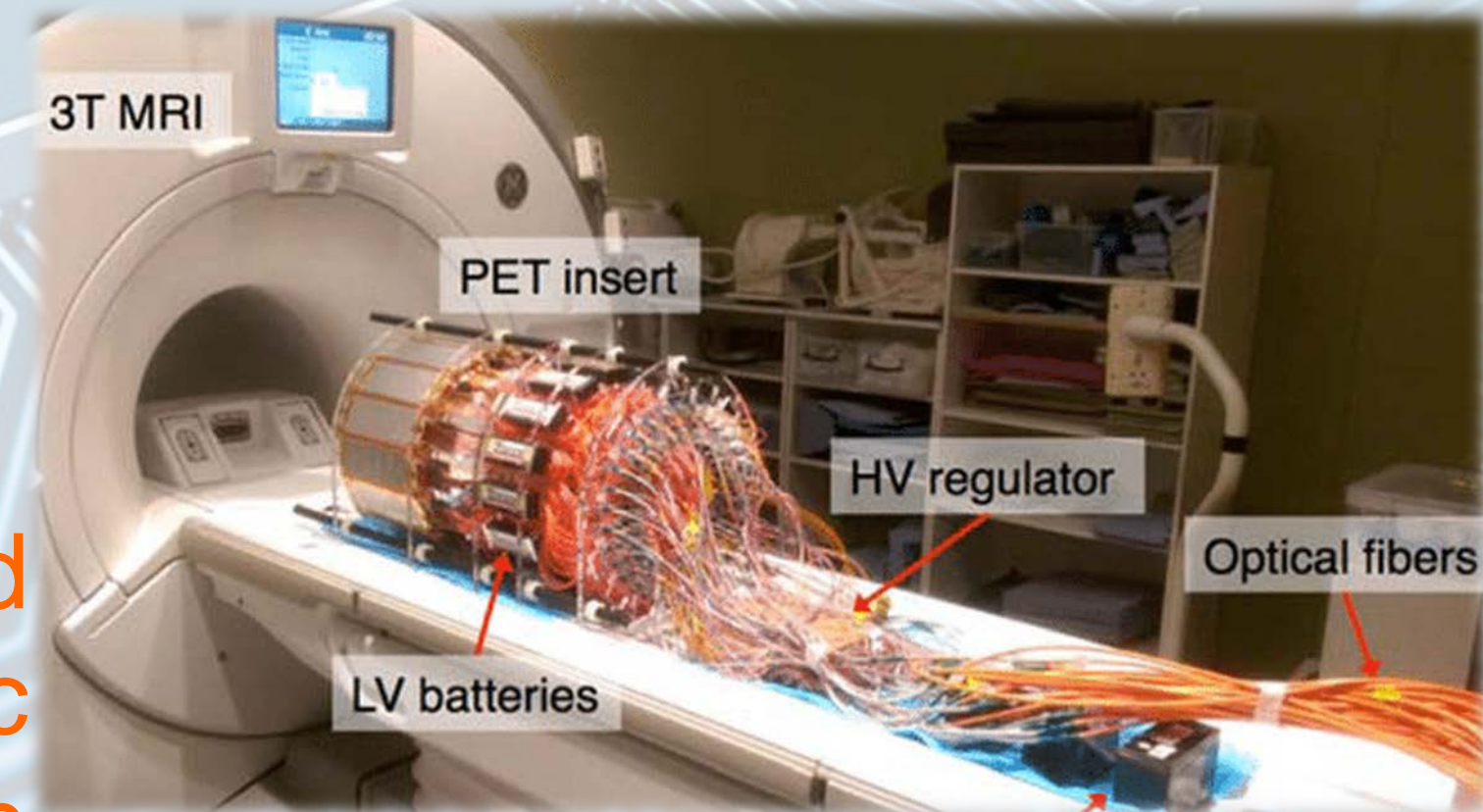
consumer electronics



Internet of Things & wearable



clinical and
scientific
instrumentation



Electronics is wherever **hardware, products, system, innovation, intelligence...** are !

Where is ELECTRONICS?

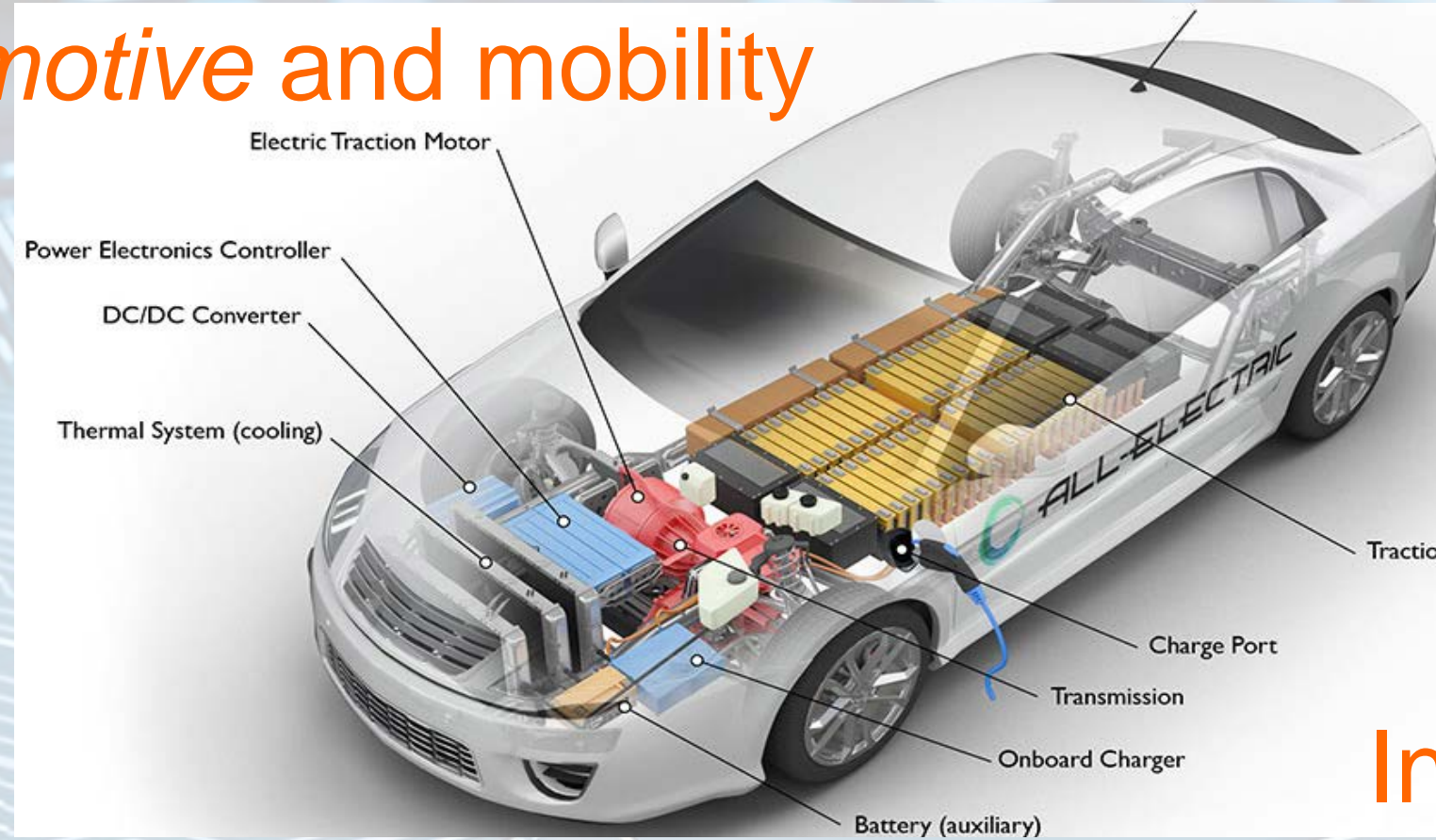


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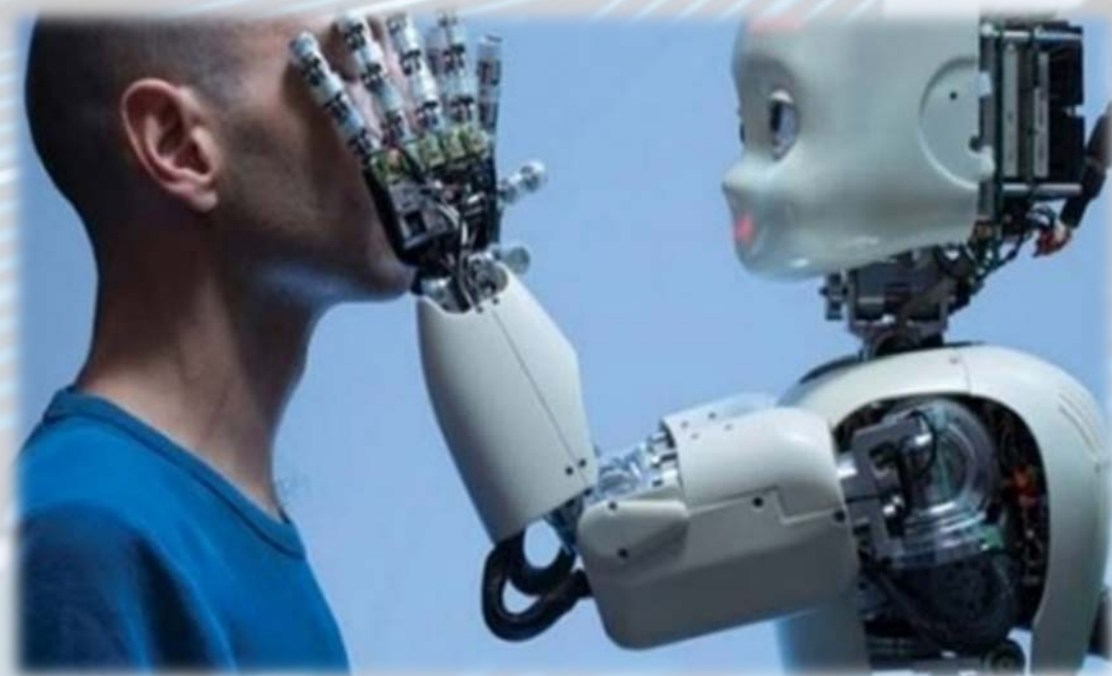
avionics and transportation

automotive and mobility



Industrial automation

robot and drones

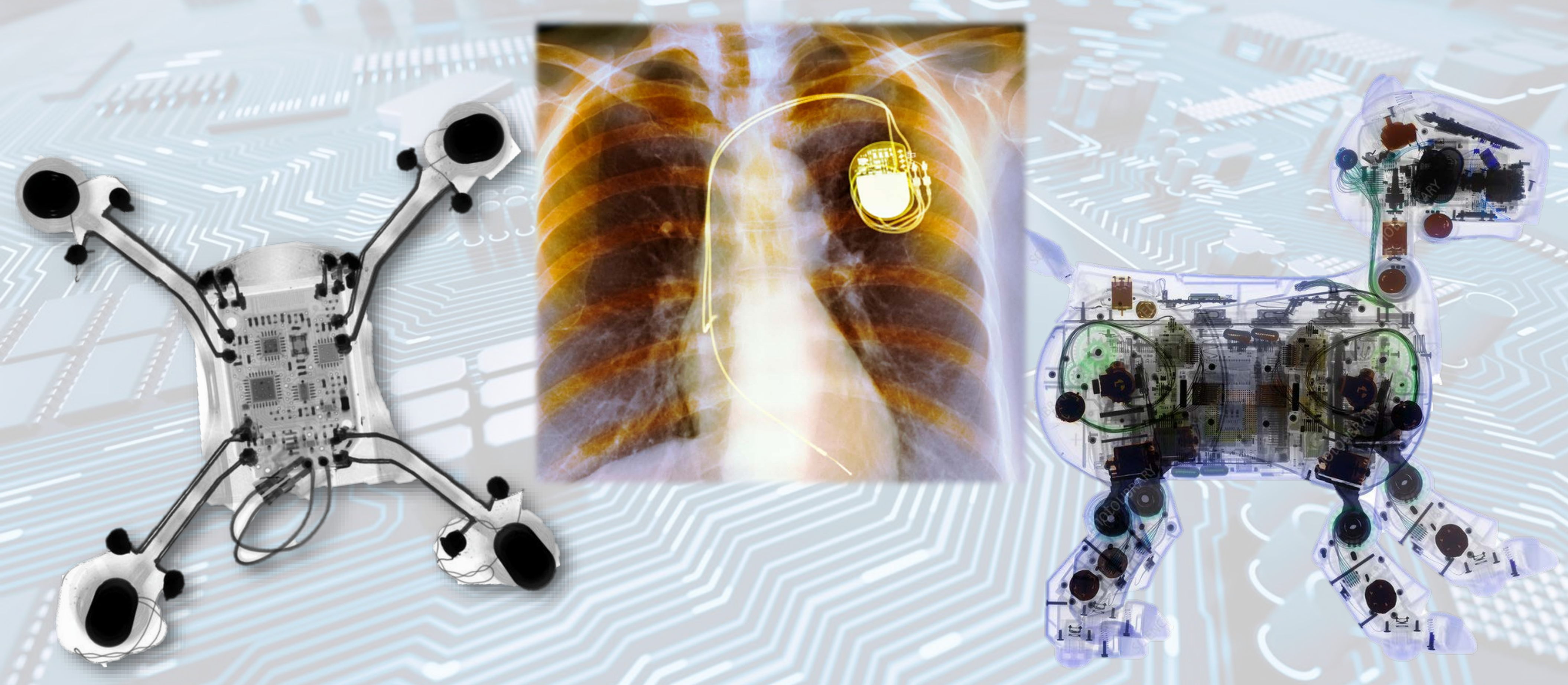


Electronics is wherever **hardware, products, system, innovation, intelligence...** are !

ELECTRONICS is "inside" ...

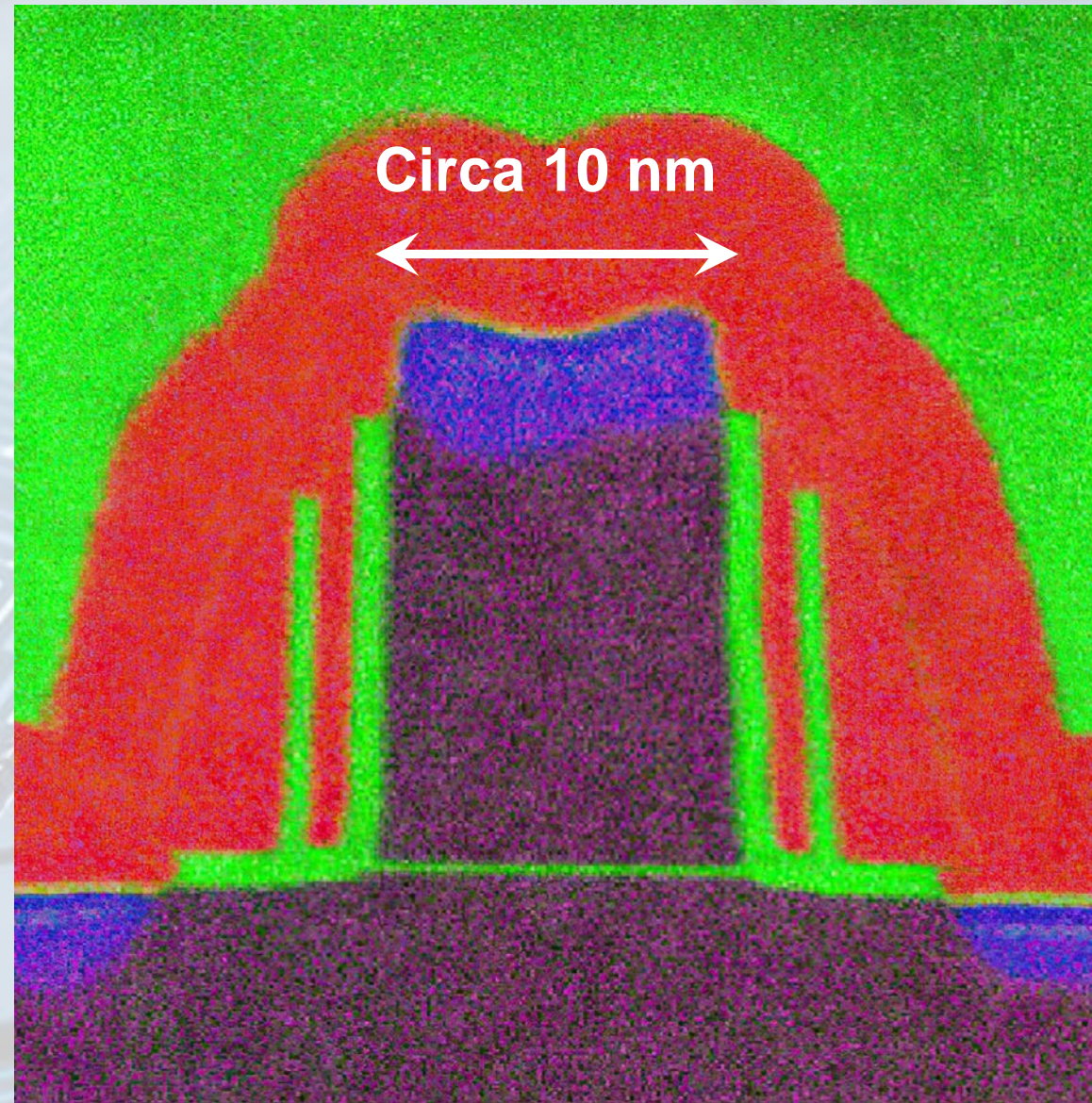


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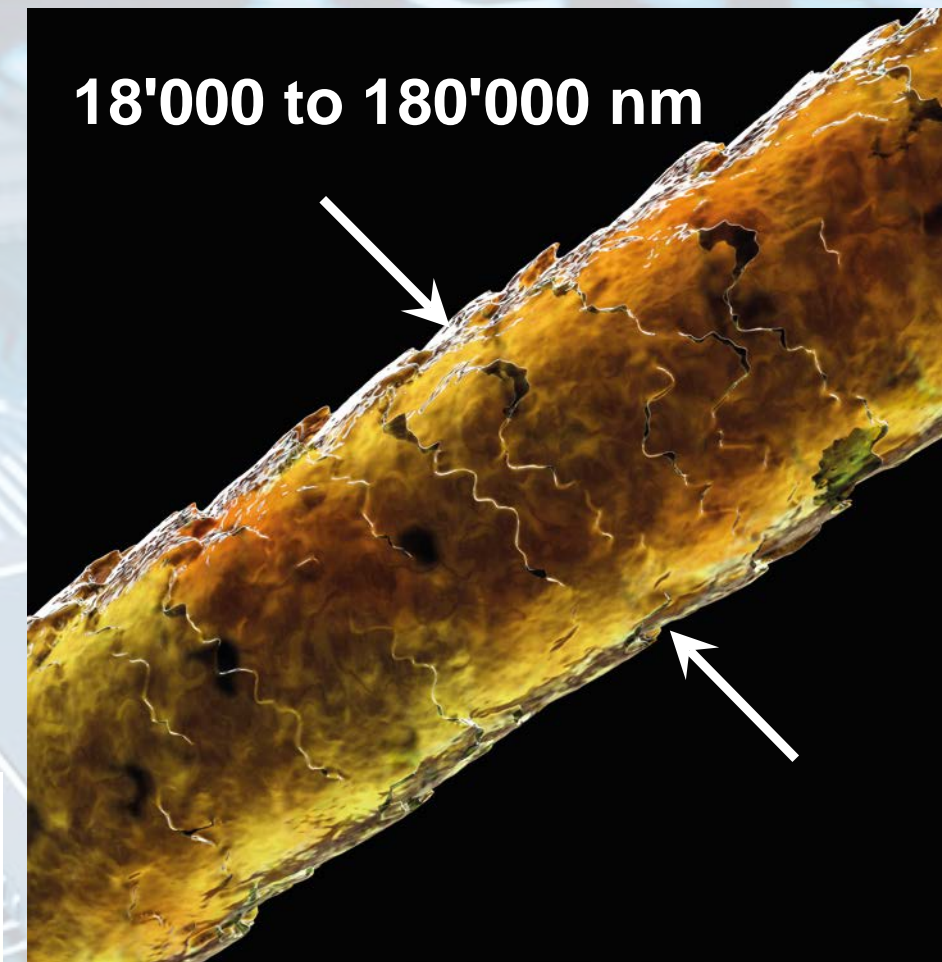
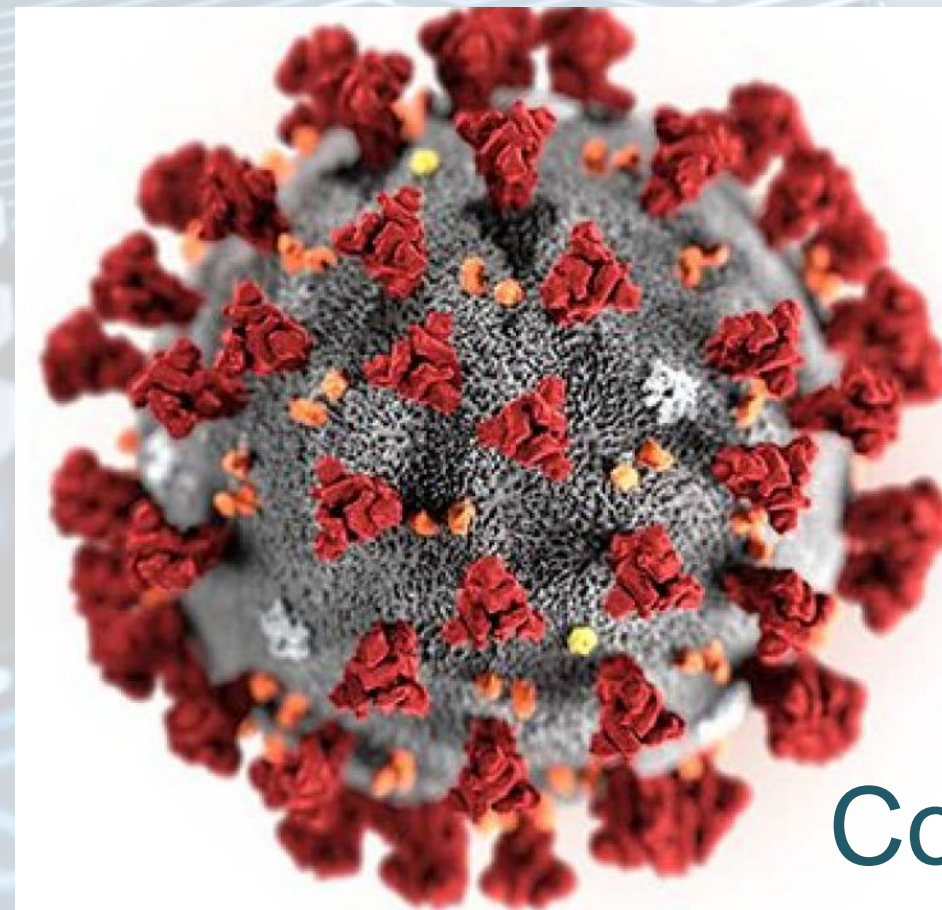
Electronics is **inside** whatever is **intelligent**, **autonomous**, **mobile**, even inside **humans** !

... from the smallest...



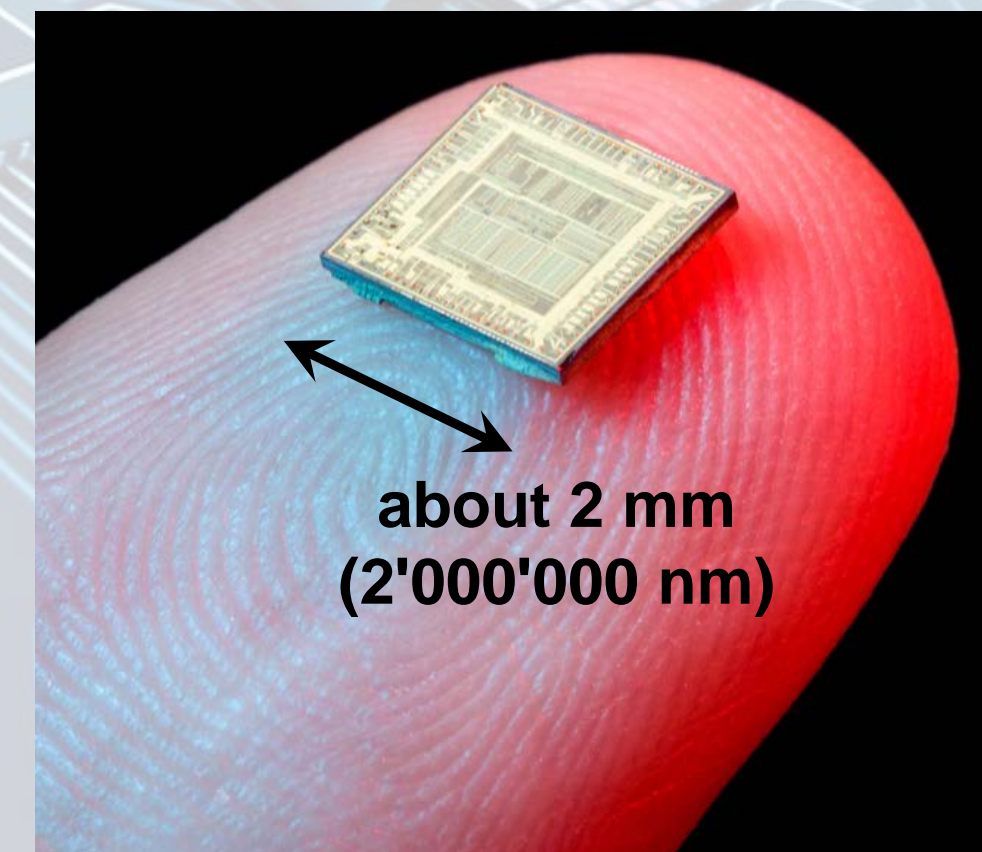
Section of a modern
TRANSISTOR

about 120 nm



Human hair

MICROCHIP

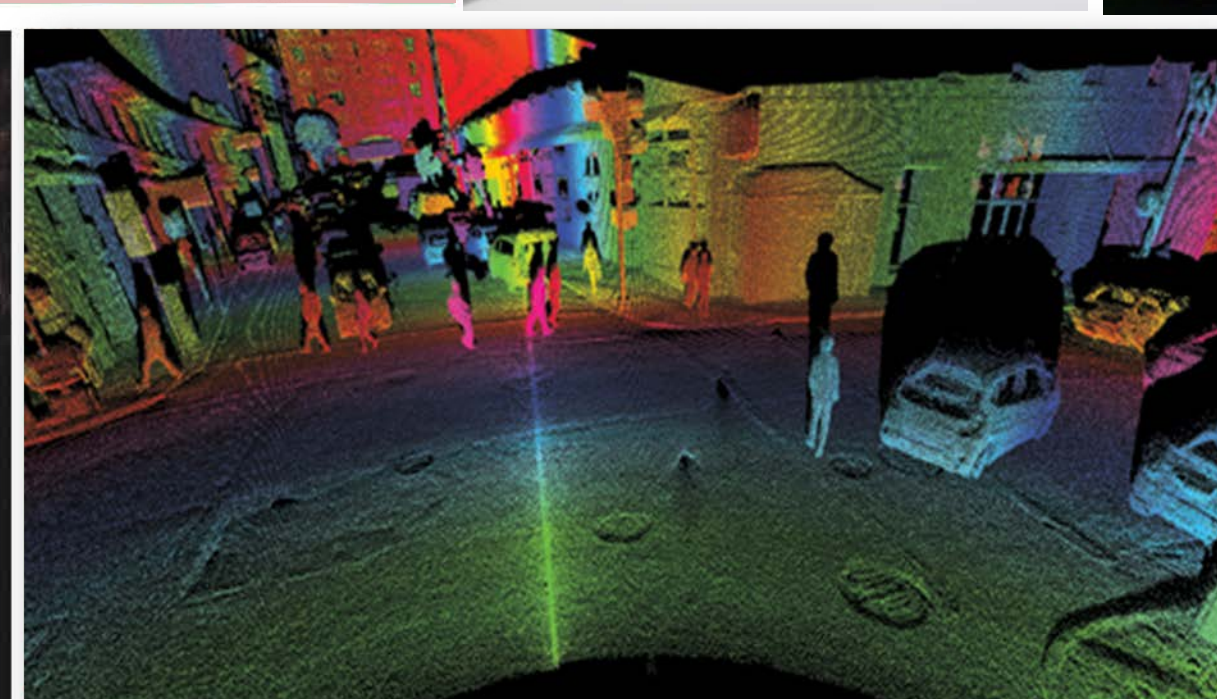
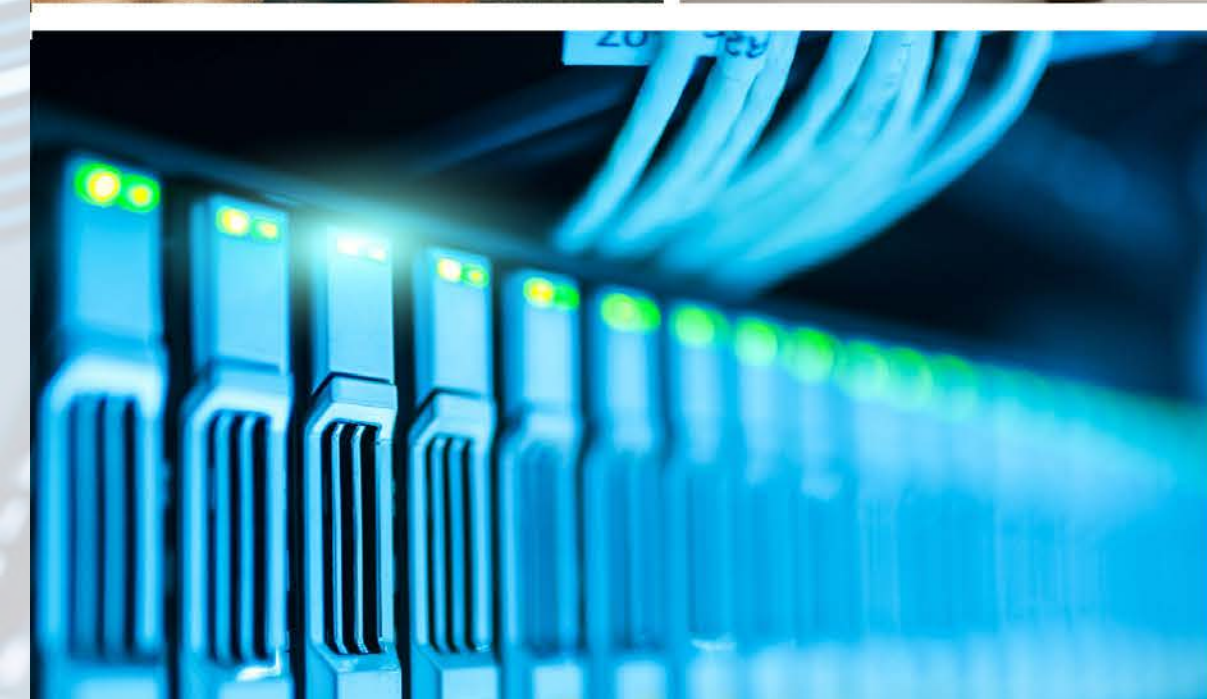
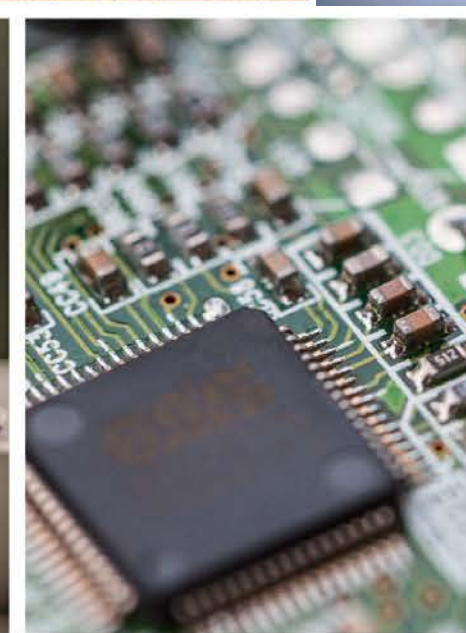
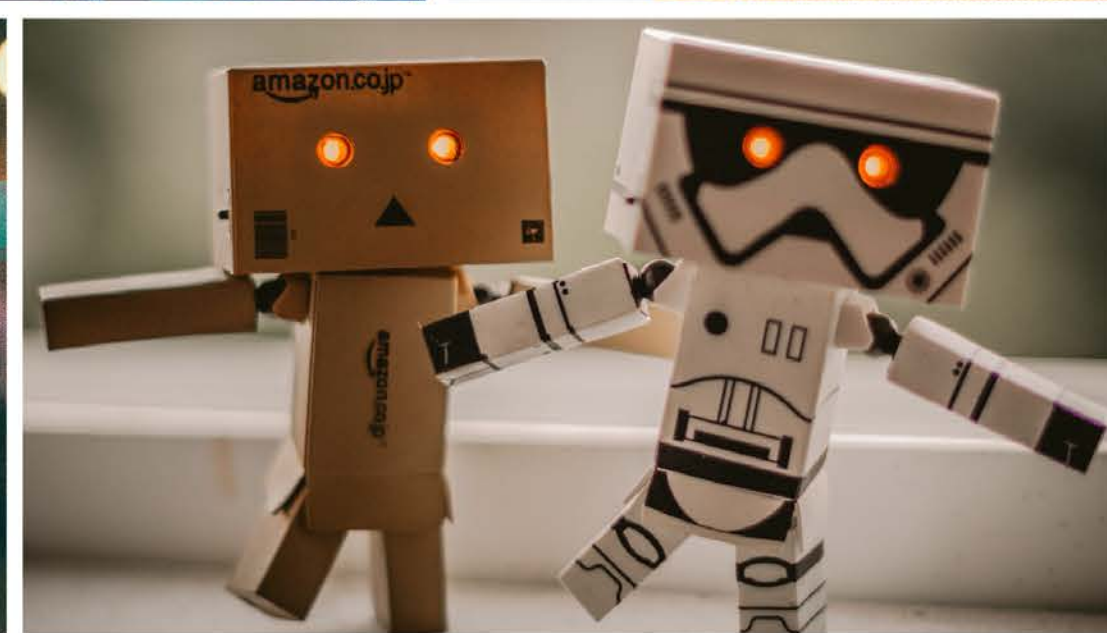
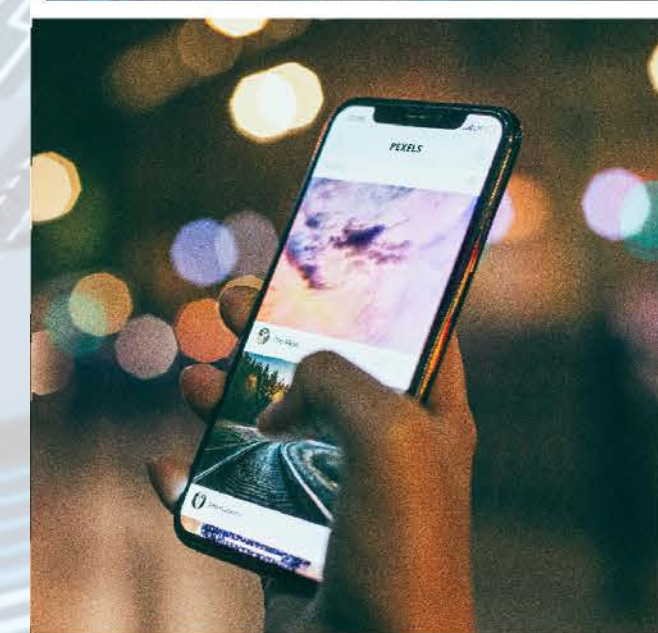
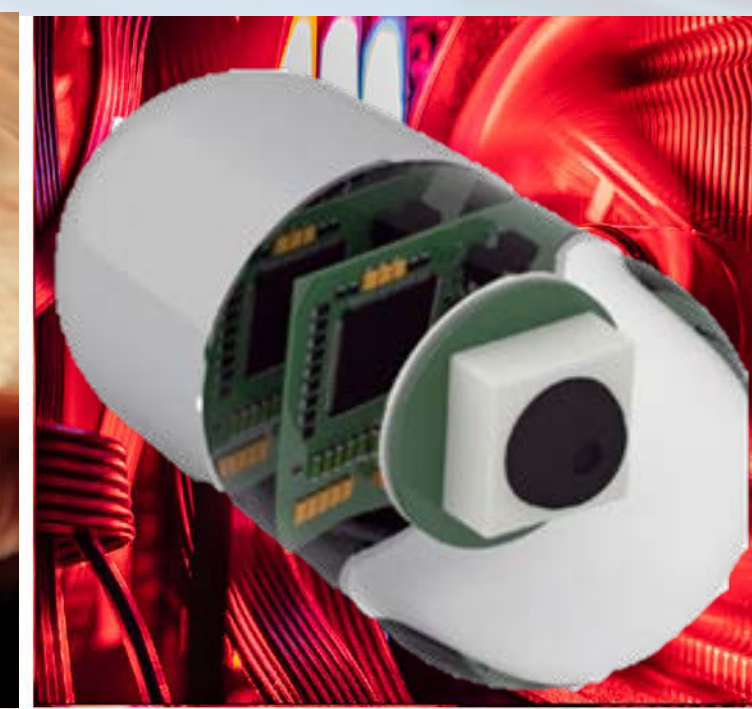


Electronic Engineers start from **electrons** and **holes**, to conceive **nanometric devices**, integrate them in a **micrometric** and **millimetric circuit**, so to define the **macro** system.

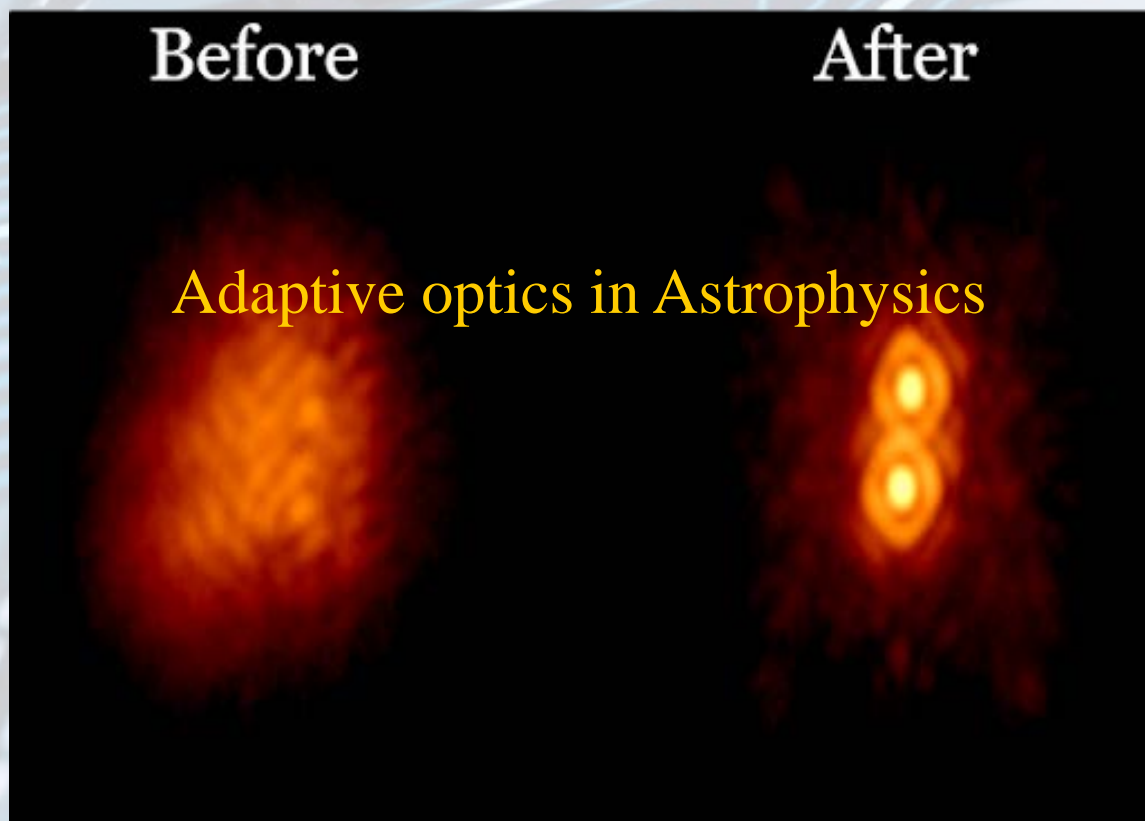
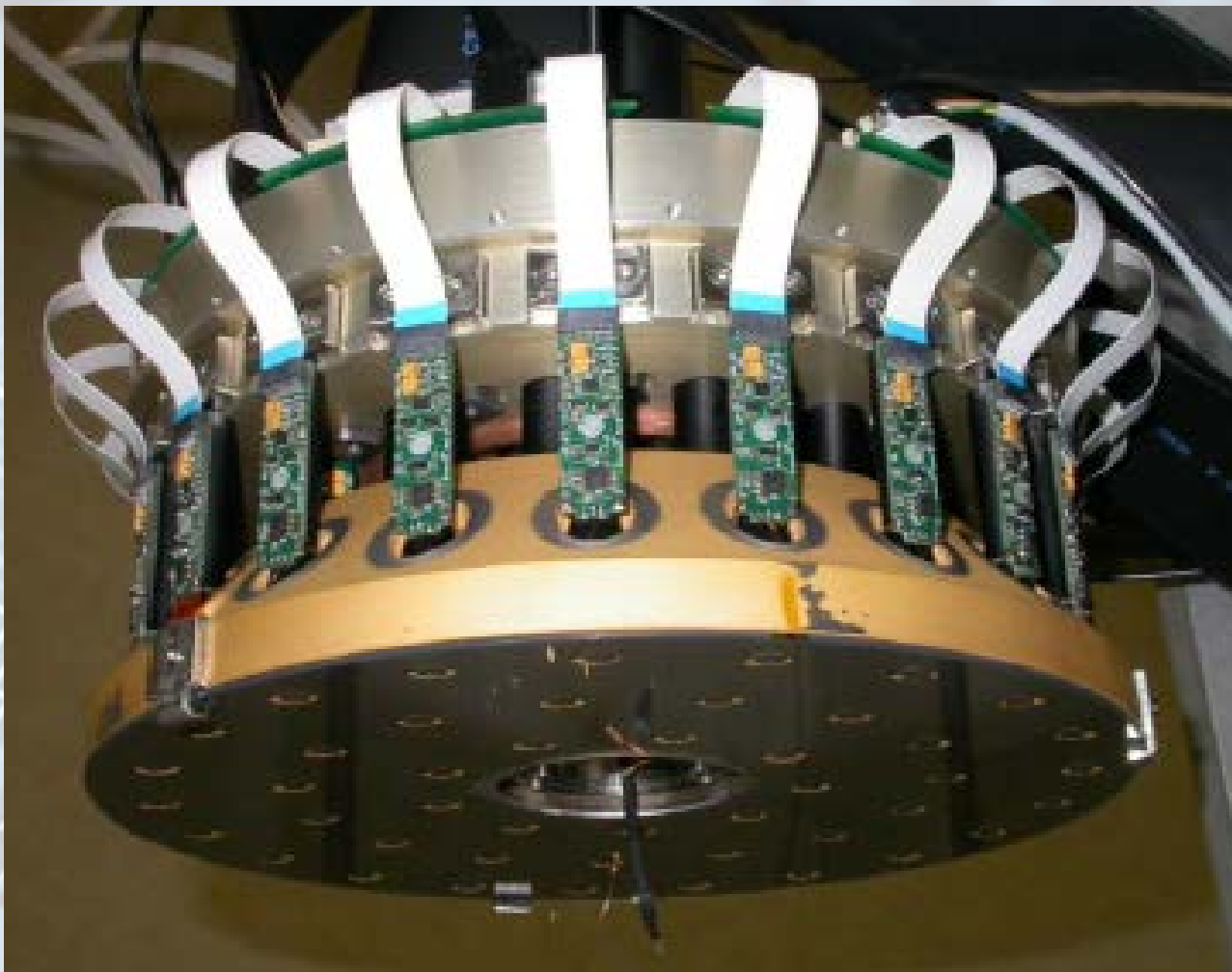
... to the big...



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... and toward the enormous !



LEAD LUNAR EXPLORATION ANALOGUE DEPLOYMENT

JUNO, A RUGGED, ALL-TERRAIN ROVER TEST COMPONENTS

- LIDAR**
Takes digital 3D images of the rover's immediate environment
- DRIVE CAMERAS (3)**
Provide situational awareness to the remote operators to avoid obstacles and precisely position the rover
- ROBOTIC ARM**
Collects rock or soil samples and manipulates the sample canister
- AVIONICS MODULE**
Suite of on-board electronics
- SAMPLE CANISTER MOCK-UP**
Emulates the container that would store the samples to be returned to Earth
- GPS GROUND-TRUTH SYSTEM**
Logs actual localization data for post-mission analysis
- EMBEDDED VISUAL ODOMETRY (EVO) SYSTEM**
Stereo camera and computing unit providing real-time localization of the rover
- SCIENCE CAMERA**
Provides panoramas and high-resolution imagery with its pan, tilt and zoom features
- RADIO SYSTEM**
Provides communications with the remote control station

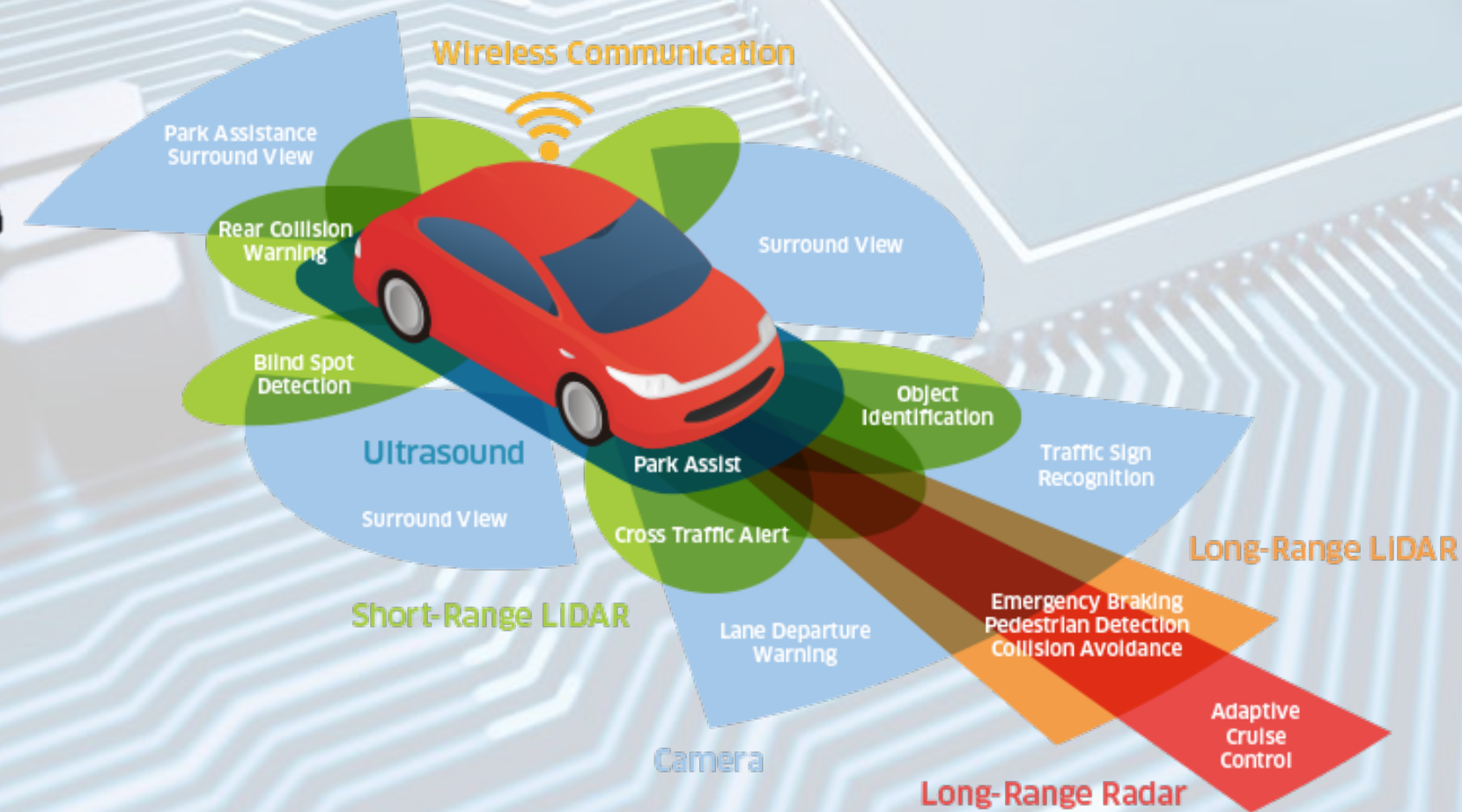
Canadian Space Agency / Agence spatiale canadienne

Who is the Electronic Engineer?



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grasps the **needs** and conceives the **solutions**:
creates, simulates, designs, makes, validates, installs...
devices, components, circuits, apparatus, systems...



Electronic Engineers operate in all "**smart**" and **autonomous** sectors of modern life !

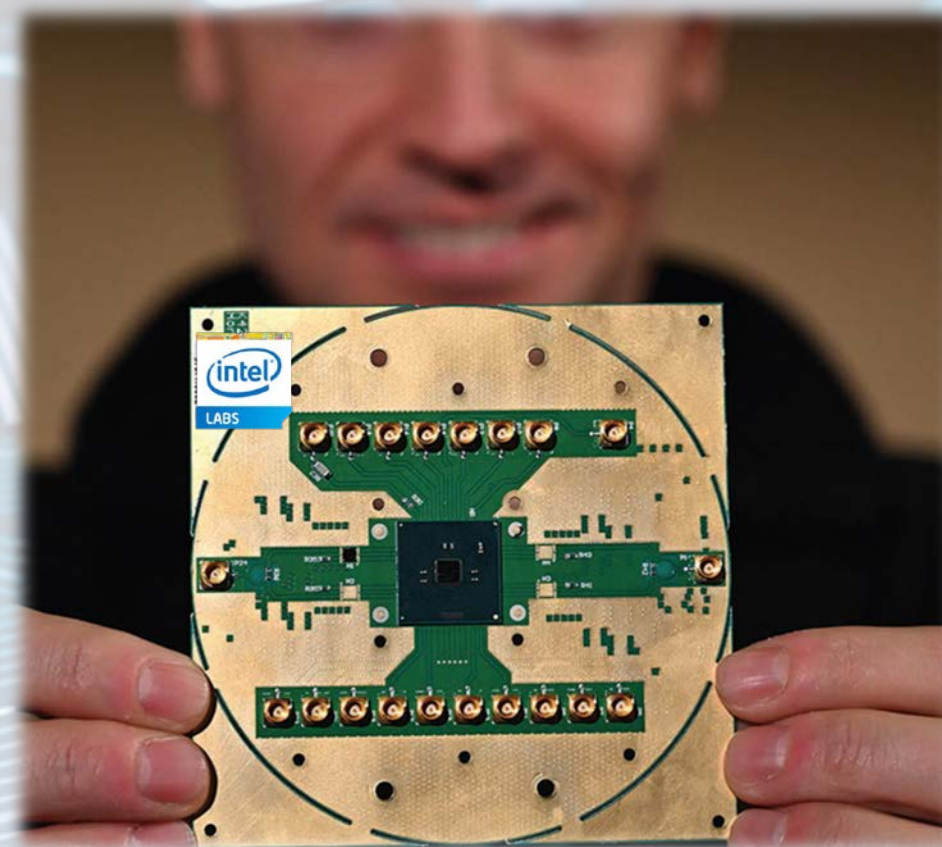
Electronics makes your dreams come true



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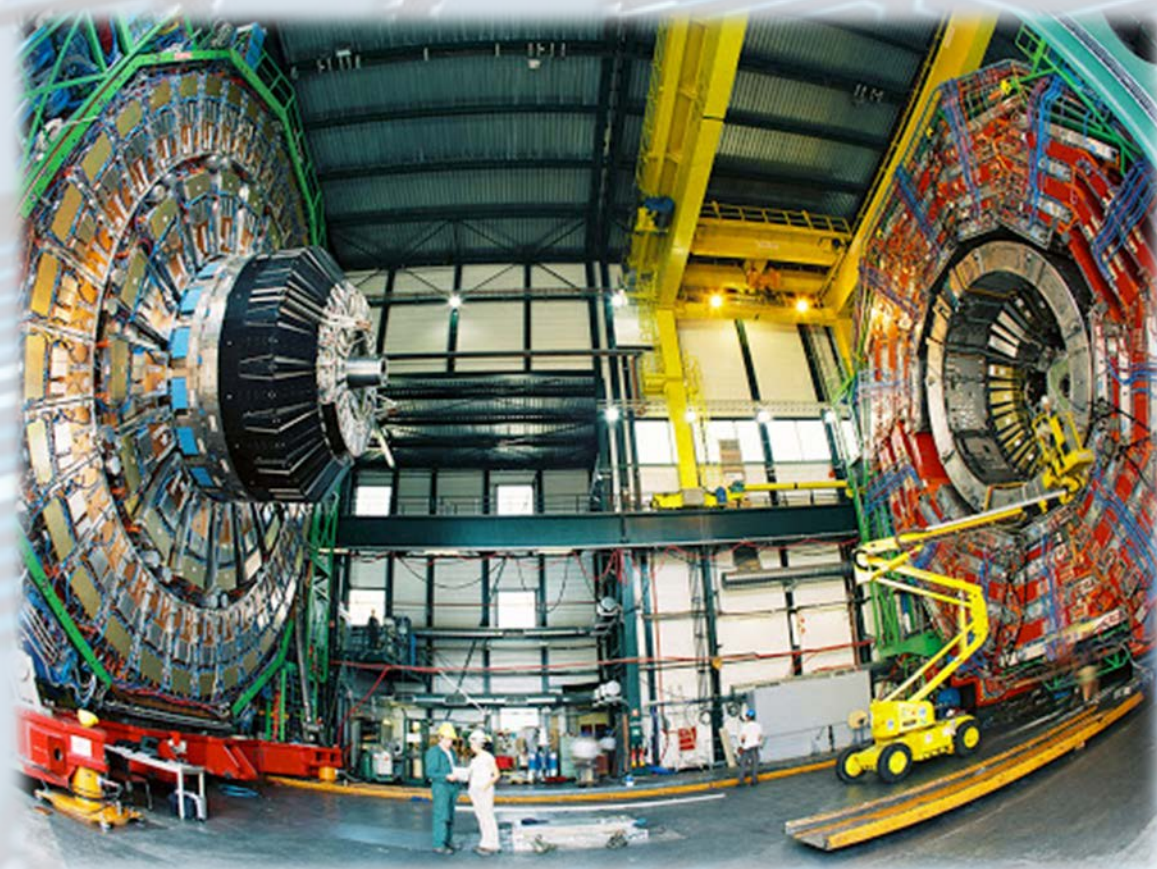
John is **quality manager** in the GT Division of Ferrari, in Maranello



Stephan is **principal engineer** on quantum computers at Intel Labs

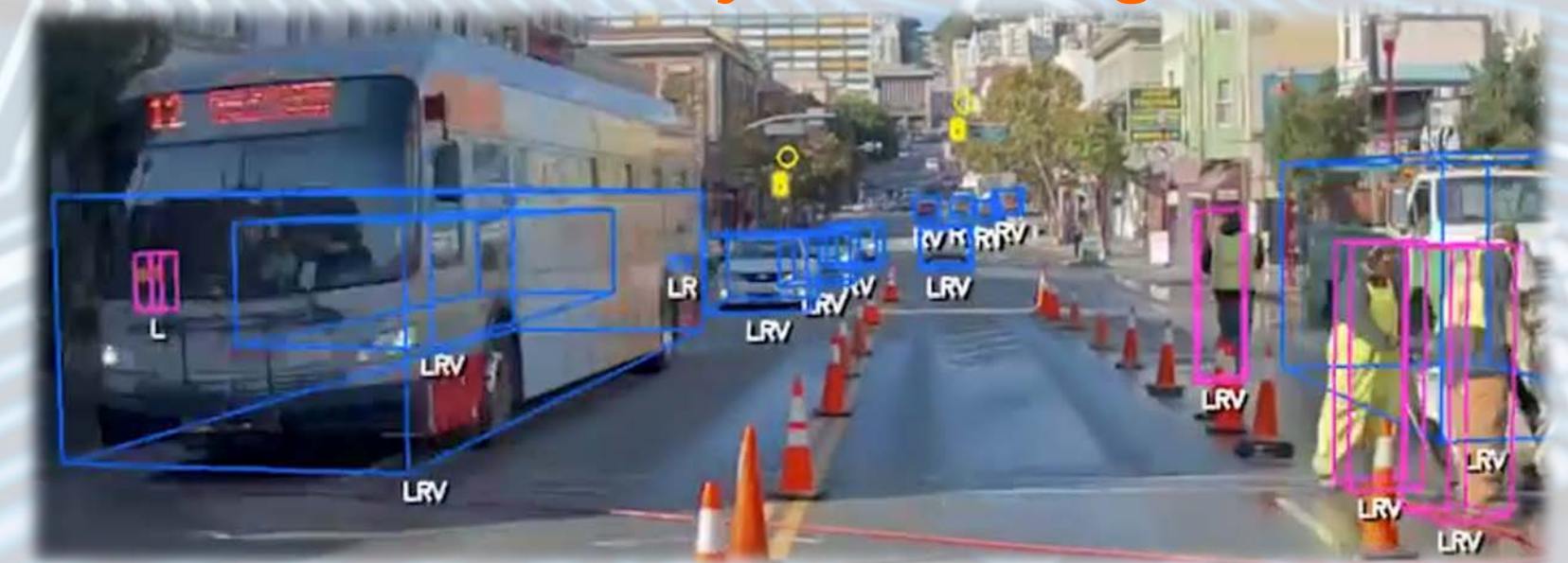


Helena is **program manager** in Apple



Robert works on an international **scientific experiment** at CERN

Irene is 3D sensor **systems engineer** at Zoox



Graduates in Electronics Engineering go everywhere and **realize dreams** – his/her own and those of other

people

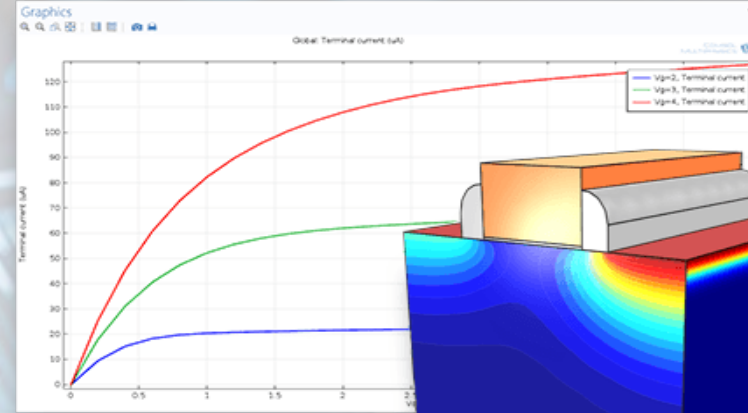
Where the Electronic Engineer works...



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component

device

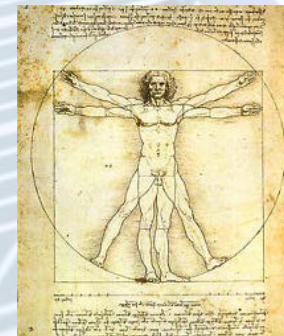


physics
chemistry
mathematics

system

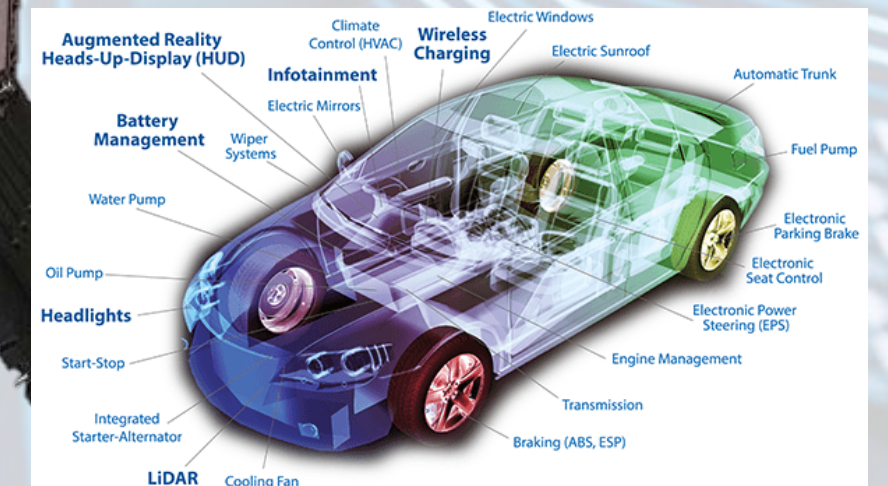
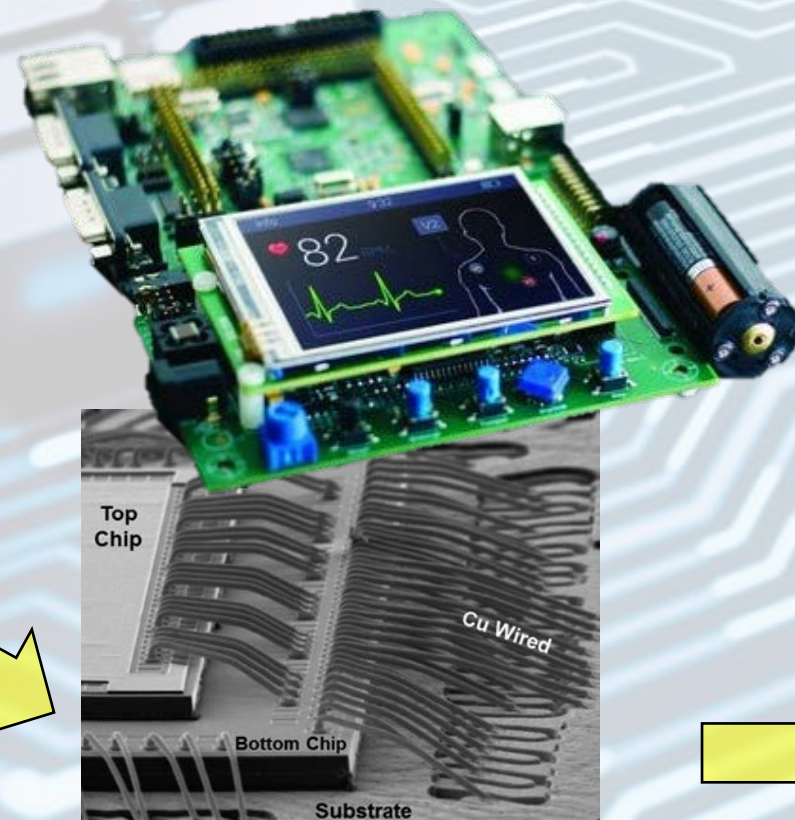
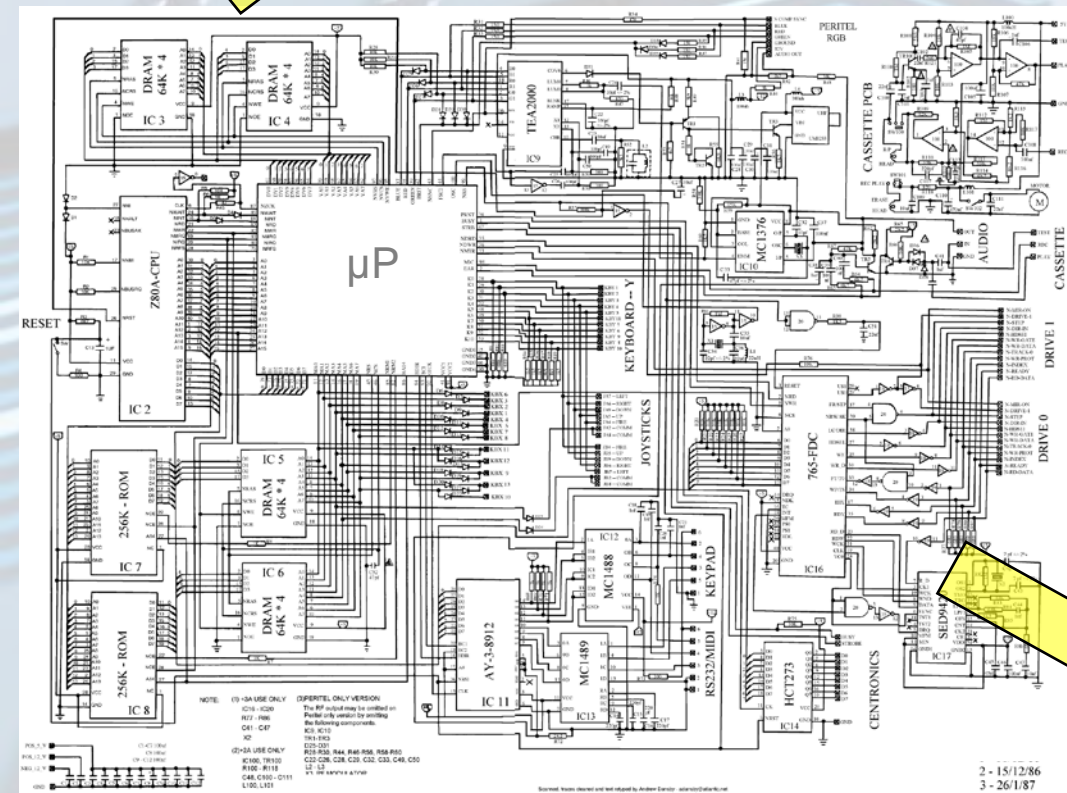
circuit

prototype



products

apparatus



Electronic Engineers operate all along the production and supply chain of modern life systems.

- **spot** what to solve and how
- **define** specs, requirements, constraints, costs, pros/cons
- **select** design methodologies and technologies
- **design** electron devices
- **develop** integrated circuits, electronic boards, mixed systems
- **exploit** sensors, actuators, μ P, FPGA, DSP, ... at best
- **integrate** electronics into applications (atm, bio, ene, mec, inf, tlc ...)
- **validate** through instrumentation
- **manage** "ilities" in plants and systems (reliability, manufacturability, testability ...)
- **profit**

Electronic Engineers operate in all sectors from **ideas** to **realization**, **production** and **management** !

- **microelectronics** for semiconductors / integrated circuits
- **high-tech industries** (mechatronics, avionics, energy, automotive, space...)
- **companies** for smart electronics (infotainment, telecomm, computers...)
- **industrial automation** and **robotics** for manufacturing
- **infrastructures** for communications / networks / cloud / grid
- **R&D** genetics / pharmacology / medicine
- **start-up & spin-off** companies
- **consultancy** and **entrepreneurship**
- **public/private scientific/technological organizations**
- ... **Ph.D.**

Electronic Engineers operate in all high-tech and R&D companies !



- Politecnico di Milano: Schools and Masters



- Electronics and Engineering: what and why?



- **Master Degree in Electronics Engineering**



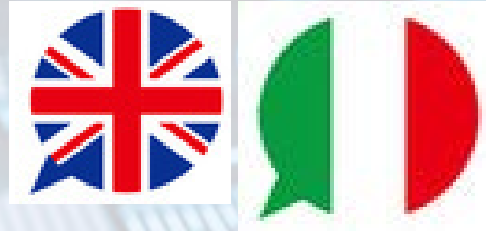
- Data and Stats

Study Programme



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MILANO 1863

PhD

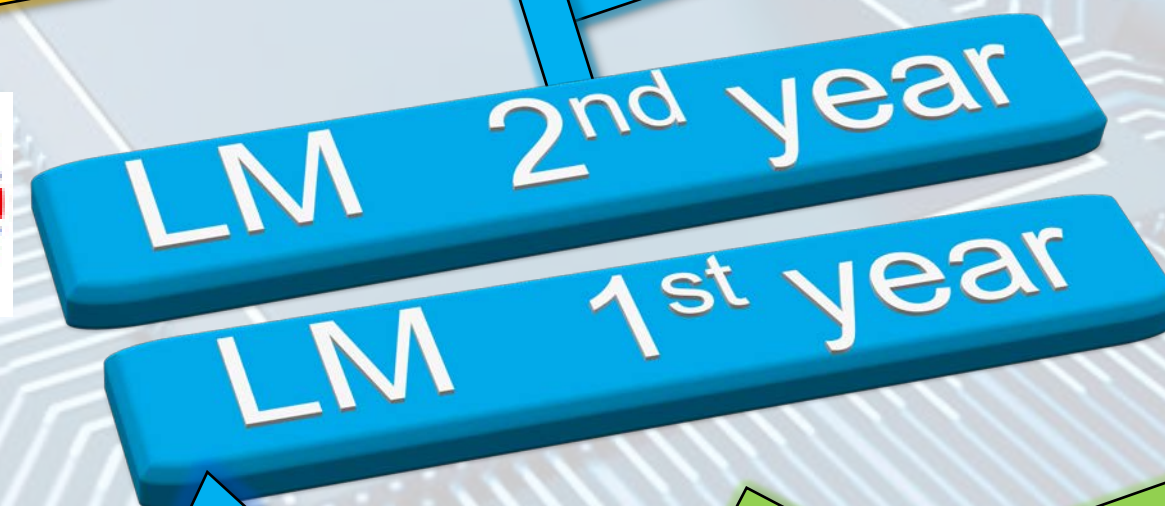


“Master degree” and
job or R&D



from other Italian Masters and worldwide Masters

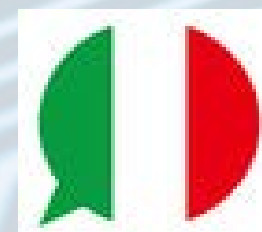
Master LM



“Bachelor
degree”
and job

from other Italian Bachelors and worldwide Bachelors

Bachelor L



Electronics is not Electrical Eng.

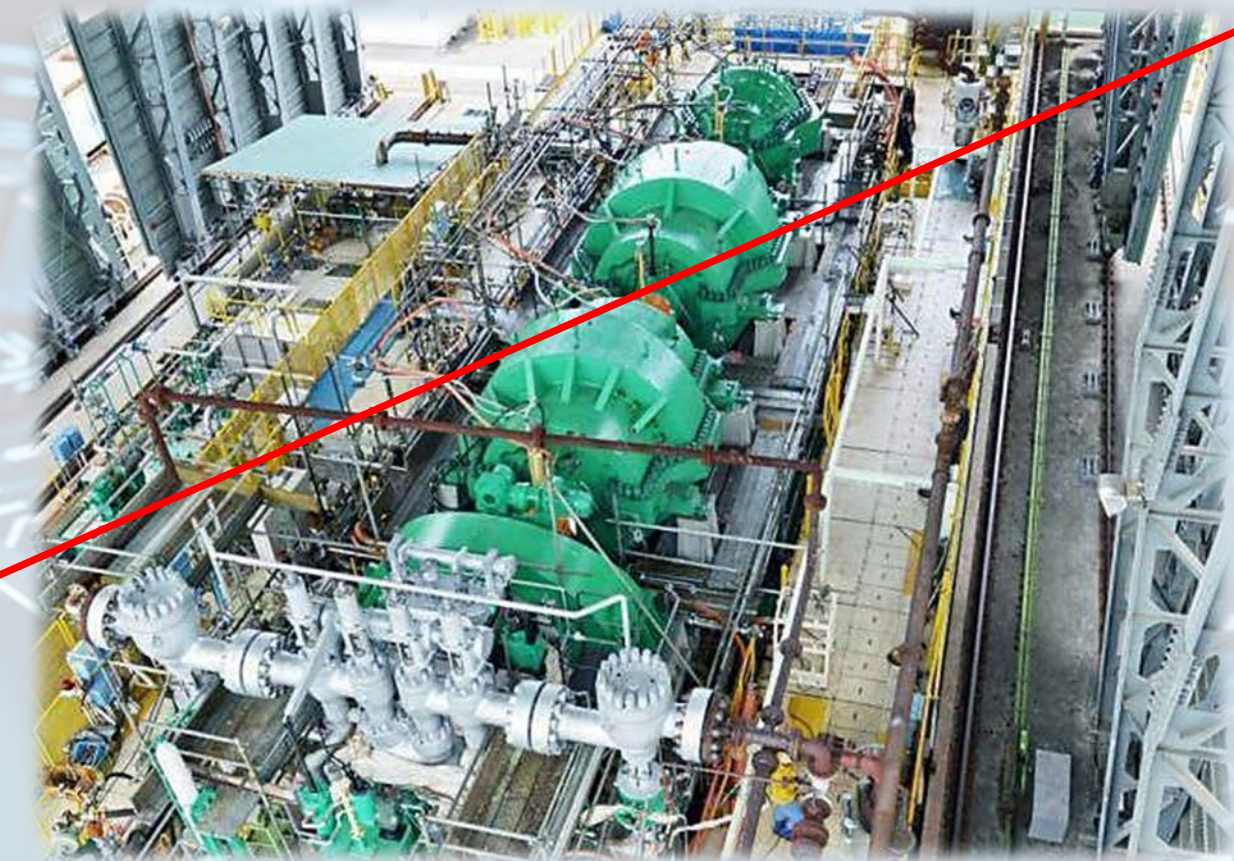


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production, transmission,
distribution of electric energy



wide-area power-grid



heavy industry

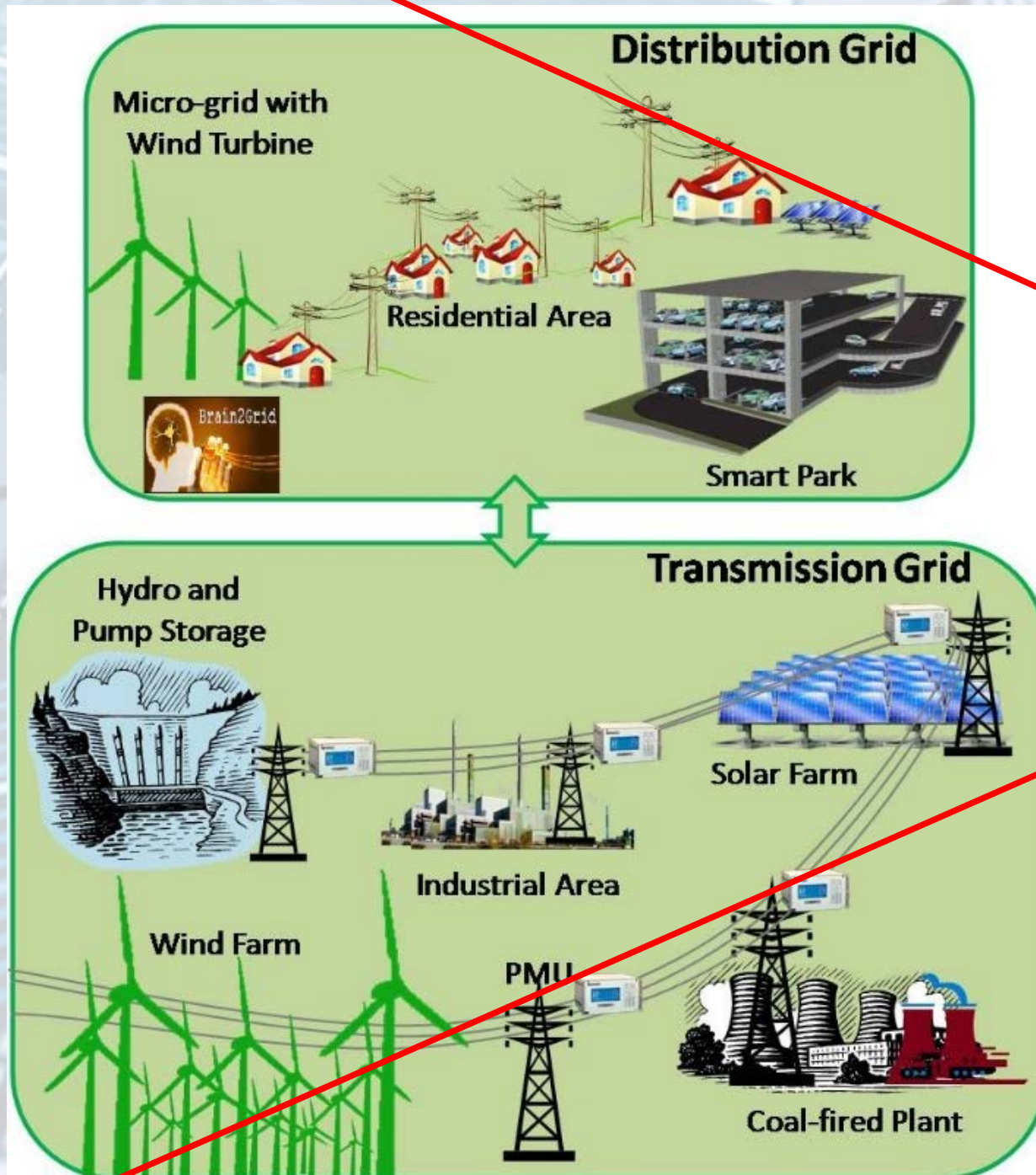


e-vehicles



electrical machines

electric traction



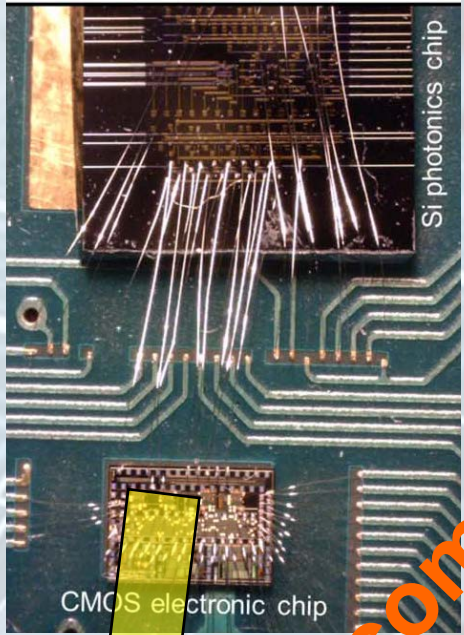
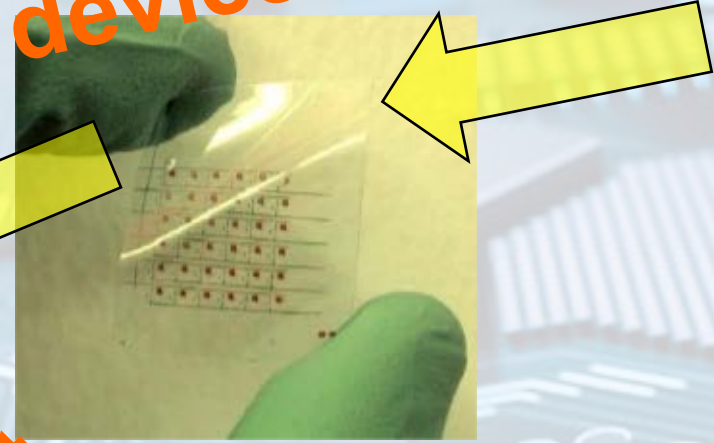
Electrical is high voltage/current/power/machines

Electronics minimizes dissipation/power/bulkiness

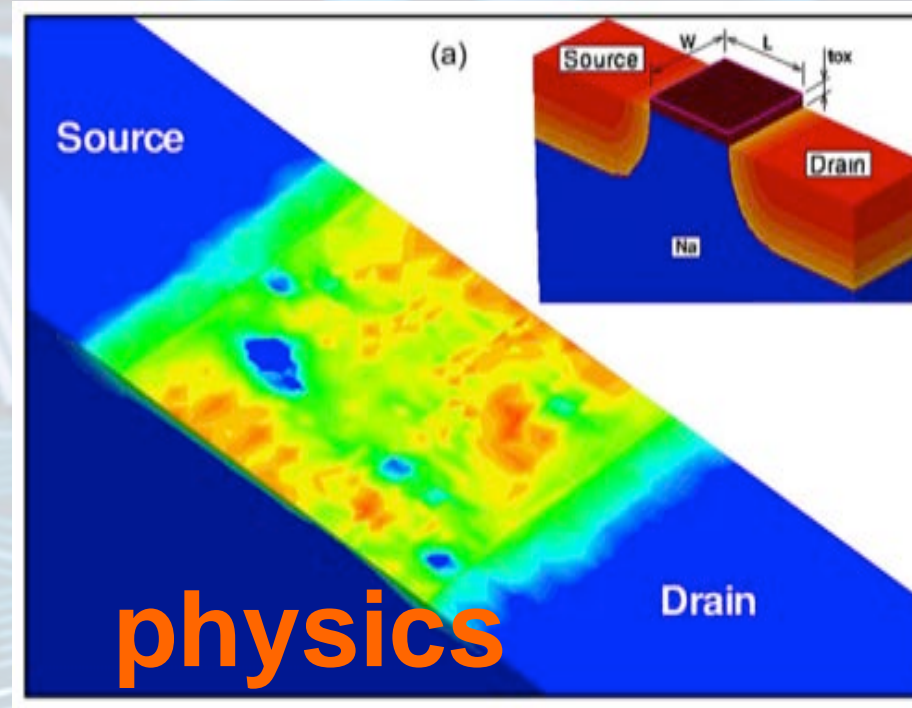
Goals of the M.S.E.E.



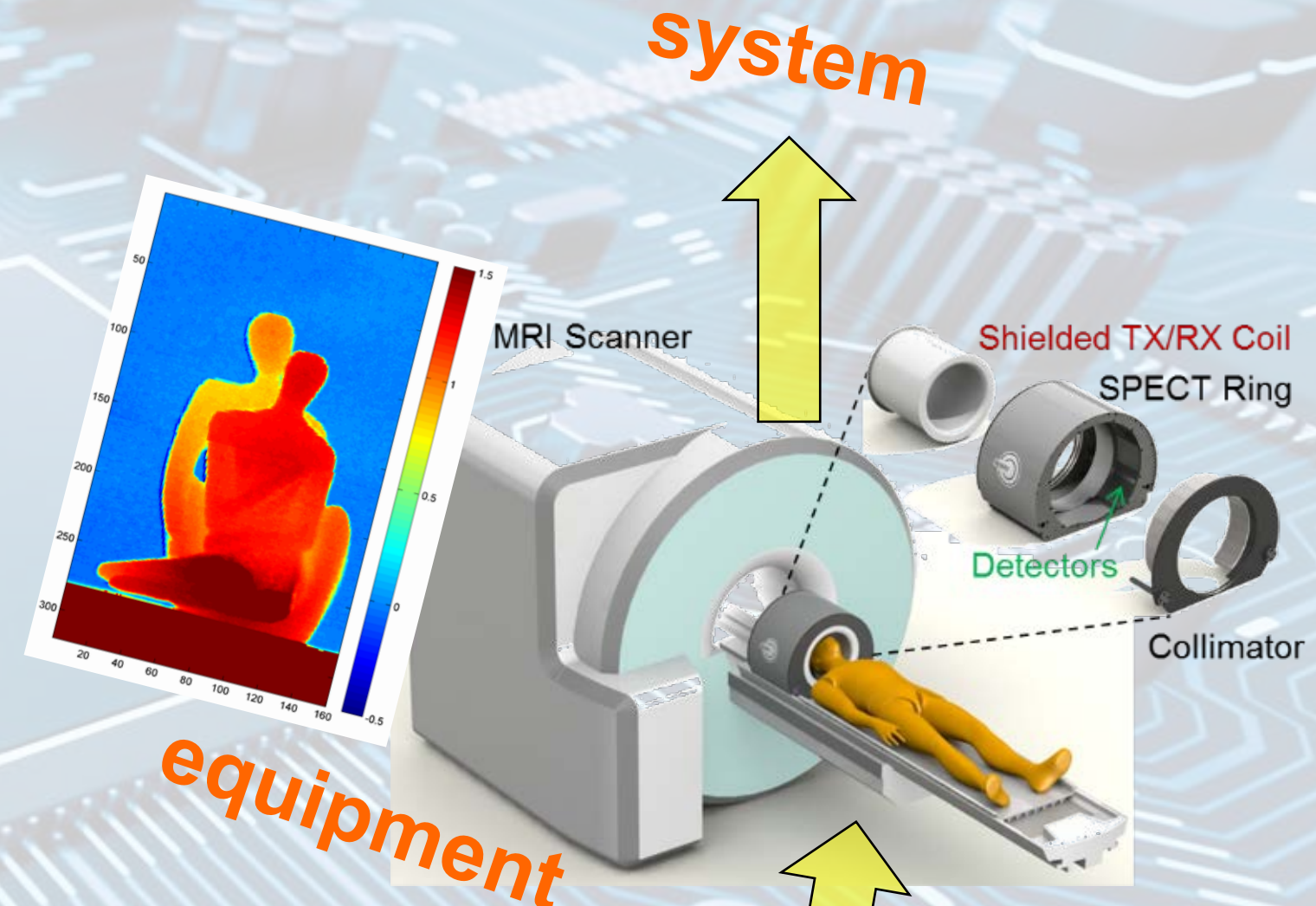
device



component



physics
chemistry
math



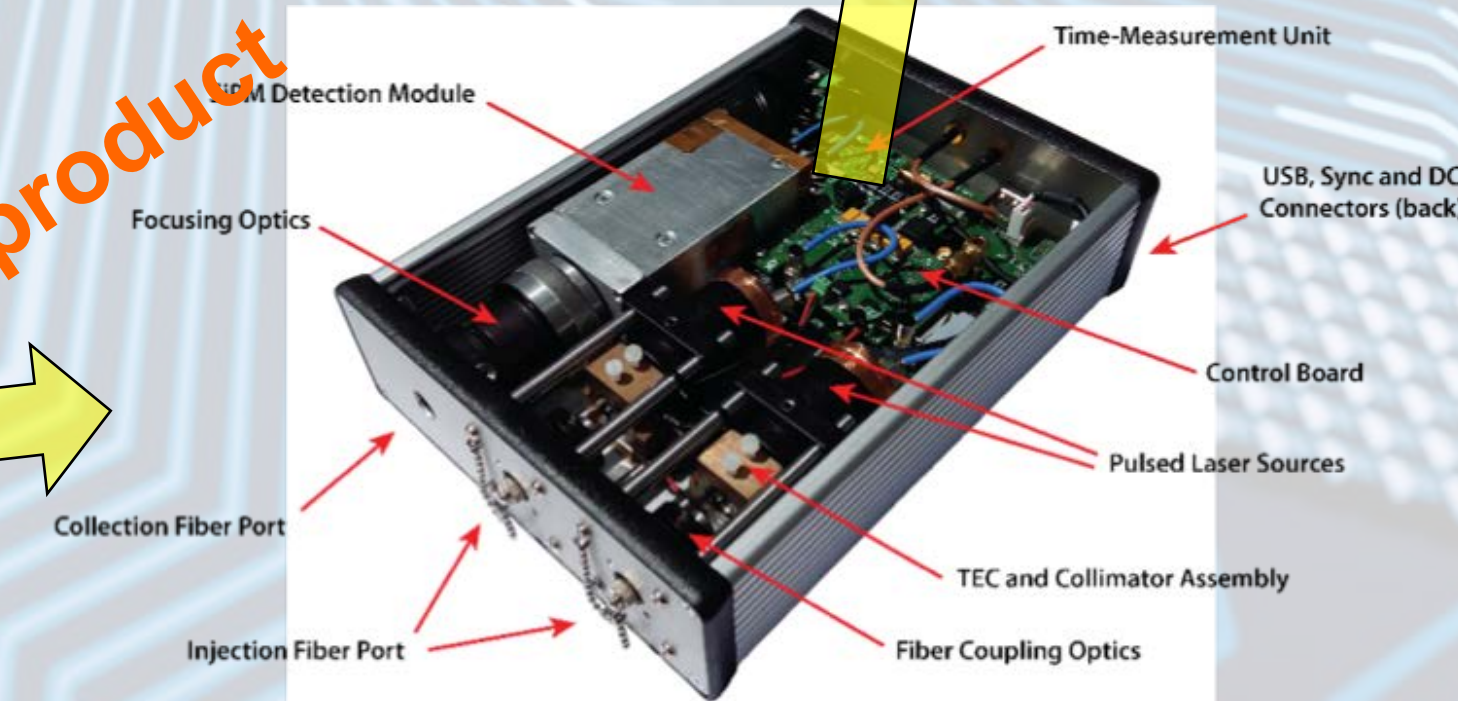
system

equipment

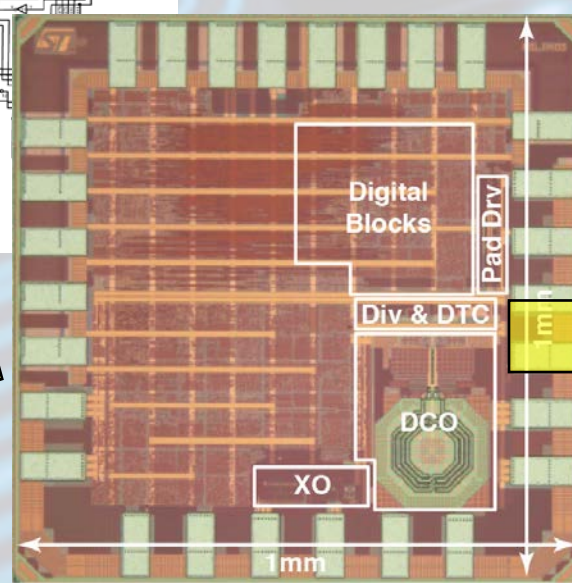
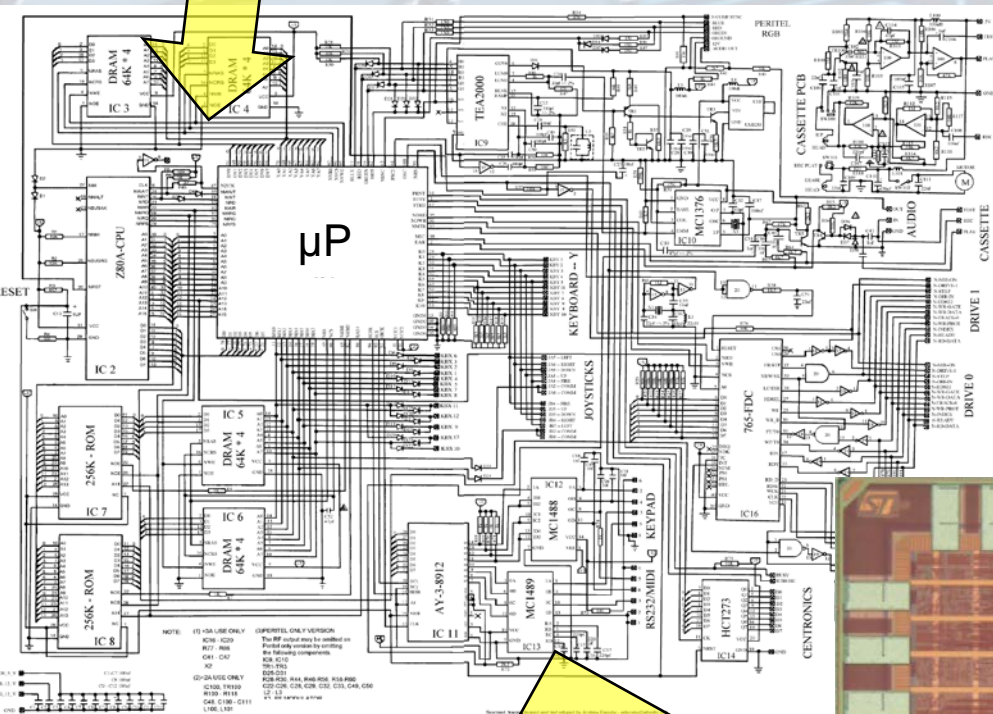
prototype



product



circuit



Useful Contacts



POLITECNICO
MILANO 1863

Student email: name.surname@mail.polimi.it

Teacher email: name.surname@polimi.it

Phone number: **(02-2399) xxxx**

Enrollment to the Master:

(international students) prof. christian.monzio@polimi.it

(Italian students) prof. massimo.ghioni@polimi.it and prof. salvatore.levantino@polimi.it

Study Plans: prof. chiara.guazzoni@polimi.it

Coordinator: prof. franco.zappa@polimi.it



from Bachelor

1° anno LM ELN

tipologia	Nome Insegnamento	Sem	CFU	di cui di D.I.	CFU Gruppo
caratterizzante	ANALOG CIRCUIT DESIGN	1	10	1	10
caratterizzante	ELECTRONIC SYSTEMS	1	10		10
caratterizzante	ELECTRON DEVICES	1	10		10
caratterizzante	MEMS AND MICROSENSORS	1	10		10
caratterizzante	SIGNAL RECOVERY	2	10		10
caratterizzante	DIGITAL INTEGRATED CIRCUIT DESIGN	2	10		10
caratterizzante	RF CIRCUIT DESIGN	2	10		10
caratterizzante	DIGITAL ELECTRONIC SYSTEMS DESIGN	2	5	3	5
caratterizzante	MICROELECTRONIC TECHNOLOGIES	2	5	1	5
affine	<i>Insegnamenti a scelta dal Gruppo TAB1</i>	--	--		5

100 CFU in 2 years: **60 CFU at the 1st year**, corresponding to **7 classes** taught in **English**.
One course of 10 CFU corresponds to 60h of lessons and 40h of exercises.



2° anno LM ELN

tipologia	Nome Insegnamento	Sem	CFU	di cui di D.I.	CFU Gruppo
caratterizzante	MIXED-SIGNAL CIRCUIT DESIGN	1	10		10
caratterizzante	POWER ELECTRONICS	1	10		
affine	<i>Insegnamenti a scelta dal Gruppo TAB1</i>	--	--		10
caratterizzante	BIOCHIP	2	5	2	
caratterizzante	SEMICONDUCTOR RADIATION DETECTORS	2	5		10
caratterizzante	ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUM.	2	10		
affine	<i>Insegnamenti a scelta dal Gruppo TAB1 o TAB2</i>	--	--		10
	THESIS AND FINAL EXAM		20		20

At the 2nd year only 40 CFU (**25 CFU are eligible courses**). All in **English**.
Finally 20 CFU (6-9 months) of **experimental thesis in the labs** of POLIMI or in a company.

... several electives and choices



	SSD	Denominazione Insegnamento	Sem	CFU	di cui di D.I.
	Insegnamenti del Gruppo TAB1	FIS/03	PHYSICS OF PHOTOVOLTAIC PROCESSES	1	5
FIS/03		ADVANCED OPTICS AND LASERS	1	10	
FIS/03		QUANTUM OPTICS AND INFORMATION	2	5	
FIS/03		SOLID STATE PHYSICS A	2	5	
ING-IND/31		ADVANCED CIRCUIT THEORY	2	5	
ING-INF/03		DIGITAL COMMUNICATION	1	10	1
ING-INF/03		ADVANCED DIGITAL SIGNAL PROCESSING	1	10	1
ING-INF/03		RADAR IMAGING	1	5	
ING-INF/03		QUANTUM COMMUNICATIONS	2	5	
ING-INF/04		CONTROL OF INDUSTRIAL ROBOTS	1	5	
ING-INF/04		MODEL IDENTIFICATION AND DATA ANALYSIS	1	10	
ING-INF/04		AUTOMATION AND CONTROL IN VEHICLES	2	5	
ING-INF/04		ADVANCED AND MULTIVARIABLE CONTROL	2	10	
ING-INF/05		EMBEDDED SYSTEMS	1	10	
ING-INF/05		DIGITAL SYSTEMS DESIGN METHODOLOGIES	2	10	
ING-INF/05		ADVANCED COMPUTER ARCHITECTURES	2	5	
ING-IND/34		BIOMATERIALI [C.I.]	2	10	
ING-IND/34		BIOINGEGNERIA CELLULARE	1	10	
ING-INF/06		BIOINGEGNERIA DEL SISTEMA MOTORIO	1	5	
BIO/10		BIOINFORMATICA E GENOMICA FUNZIONALE	1	5	
MAT/08	NUMERICAL METHODS IN MICROELECTRONICS	2	5		

	SSD	Denominazione Insegnamento	Sem	CFU	di cui di D.I.
	Insegnamenti del Gruppo TAB2	caratterizzante	BIOCHIP	2	5
caratterizzante		DIGITAL ELECTRONIC SYSTEMS DESIGN	2	5	
caratterizzante		DIGITAL INTEGRATED CIRCUIT DESIGN	2	10	
caratterizzante		ELECTRON DEVICES	1	10	
caratterizzante		ELECTRONICS AND ELECTROACOUSTIC FOR SOUND ENG.	2	10	
caratterizzante		ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUM.	2	10	
caratterizzante		MEMS AND MICROSENSORS	1	10	
caratterizzante		MICROELECTRONIC TECHNOLOGIES	2	5	1
caratterizzante		MIXED-SIGNAL CIRCUIT DESIGN	1	10	
caratterizzante		POWER ELECTRONICS	1	10	
caratterizzante		RF CIRCUIT DESIGN	2	10	
caratterizzante		SEMICONDUCTOR RADIATION DETECTORS	2	5	
caratterizzante		SENSOR SYSTEMS	1	5	3
caratterizzante		ANTENNAS	2	5	
caratterizzante		ELECTROMAGNETIC COMPATIBILITY	1	5	
caratterizzante		MICROWAVE ENGINEERING	2	5	
caratterizzante		PHOTONIC DEVICES	2	10	
caratterizzante		RF SYSTEMS	1	10	
caratterizzante		OPTICAL MEASUREMENTS	1	5	

Hands-on Labs and THESIS

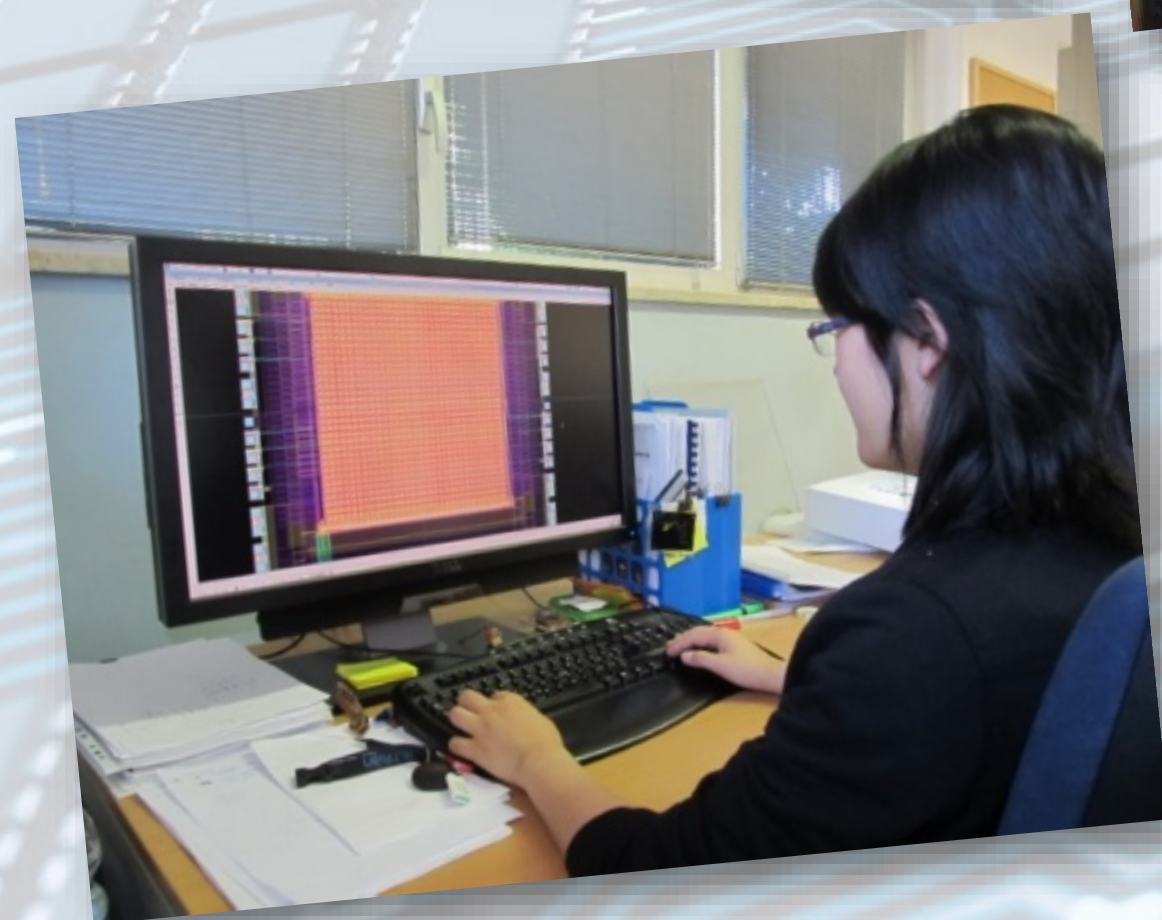


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polifab
POLITECNICO DI MILANO

www.polifab.polimi.it



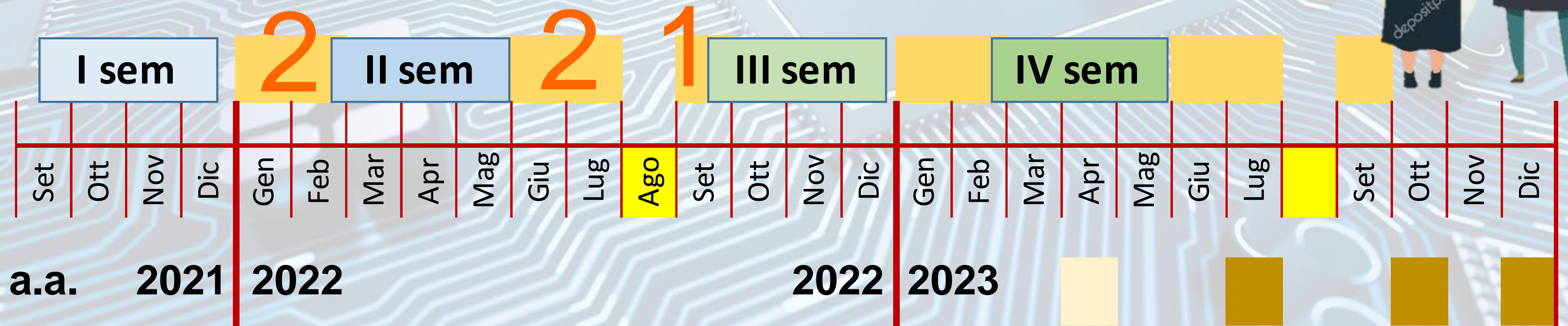
Timeline



POLITECNICO
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1st Year **2nd Year**



graduation

5 exam trials for each teaching every year.

Example of Academic Year



SESSIONE D'ESAME		1° SEMESTRE				SESSIONE D'ESAME		2° SEMESTRE				SESSIONE D'ESAME	
agosto	settembre	ottobre	novembre	dicembre	febbraio	marzo	aprile	maggio	giugno	luglio	agosto	settembre	
1 gio	1 dom	1 mar	1 ven	1 dom	1 sab	1 dom	1 mer	1 ven	1 lun	1 mer	1 gio	1 ven	
2 ven	2 lun	2 mer	2 sab	2 lun	2 dom	2 lun	2 gio	2 sab	2 mar	2 gio	2 ven	2 sab	
3 sab	3 mar	3 gio *	3 dom	3 mar	3 lun	3 mar	3 ven	3 dom	3 mer	3 ven	3 sab	3 gio	
4 dom	4 mer	4 ven *	4 lun	4 mer	4 mar	4 mer *	4 sab	4 lun	4 gio	4 sab	4 ven	4 dom	
5 lun	5 gio	5 sab	5 mar	5 gio	5 mer	5 gio *	5 dom	5 mar	5 ven	5 dom	5 lun	5 mer	
6 mar	6 ven	6 dom	6 mer	6 ven	6 lun	6 ven	6 lun	6 mer	6 sab	6 lun	6 mer	6 gio	
7 mer	7 sab	7 lun	7 gio	7 sab	7 mar	7 ven	7 sab	7 mar	7 gio	7 dom	7 mar	7 ven	
8 gio	8 dom	8 mar	8 ven	8 dom	8 mer	8 sab	8 dom	8 mer	8 ven	8 lun	8 mer	8 gio	
9 ven	9 lun	9 mer	9 sab	9 lun	9 gio	ING	9 lun	9 gio	9 sab	9 mar	9 gio	9 ven	
10 sab	10 mar *	10 gio	10 dom	10 mar	10 ven	ING	10 mar	10 ven	10 dom	10 mer	10 ven	10 sab	
11 dom	11 gio *	11 ven	11 lun	11 mar	11 sab	11 mar *	11 mer	11 sab	11 lun	11 gio	ING	11 sab	
12 lun	12 mar *	12 sab	12 mar	12 gio	12 dom	12 mer *	12 gio	12 dom	12 mar	12 ven	ING	12 dom	
13 mar	13 ven	13 dom	13 mer	13 ven	13 lun	13 gio *	13 ven	13 lun	13 mar	13 ven	13 sab	13 lun	
14 mer	14 sab	14 lun	14 gio	14 sab	14 mar	14 ven	14 sab	14 mar	14 gio	14 dom	14 mar	14 ven	
15 gio	15 dom	15 mar	15 ven	15 dom	15 mer	15 sab	15 dom	15 mer	15 ven	15 lun	15 mer	15 gio	
16 ven	16 lun	16 mer	16 sab	16 lun	16 gio	16 dom	16 lun	16 sab	16 mar	16 gio	16 ven	16 dom	
17 sab	17 mar	17 gio	17 dom	17 mar *	17 ven	17 mar	17 mar	17 dom	17 mer	17 ven	17 sab	17 gio	
18 dom	18 mer	18 ven	18 lun	18 mer *	18 sab	18 mer	18 sab	18 lun	18 gio	18 sab	18 ven	18 dom	
19 lun	19 gio	19 sab	19 mar	19 gio	19 dom	19 mer	19 gio	19 dom	19 mar	19 ven	19 sab	19 gio	
20 mar	20 ven	20 dom	20 mer	20 ven	20 lun	20 gio	20 lun	20 mer	20 sab	20 mar	20 ven	20 dom	
21 mer	21 sab	21 lun	21 gio	21 sab	21 mar	21 ven	21 sab	21 gio	21 dom	21 mer	21 ven	21 sab	
22 gio	22 dom	22 mar	22 ven	22 dom	22 mar	22 sab	22 dom	22 mer	22 ven	22 lun	22 mer	22 gio	
23 ven	23 lun	23 mer	23 sab	23 lun	23 gio	23 dom	23 lun	23 sab	23 mar	23 gio *	23 ven *	23 sab	
24 sab	24 mar	24 gio	24 dom	24 mar	24 ven	24 lun	24 mar	24 ven	24 dom	24 mer	24 ven *	24 sab	
25 dom	25 mer	25 ven	25 lun	25 mer	25 sab	25 mar	25 mer	25 sab	25 lun	25 gio	25 sab	25 dom	
26 lun	26 gio *	26 sab	26 mar	26 gio	26 dom	26 mer	26 gio	26 dom	26 mar	26 ven	26 dom	26 lun	
27 mar	27 ven *	27 dom	27 mer	27 ven	27 lun	27 gio	27 ven	27 lun	27 mer	27 sab	27 lun	27 mer	
28 mer	28 gio	28 mar	28 ven	28 sab	28 mar	28 ven	28 sab	28 gio	28 dom	28 mar	28 ven	28 sab	
29 gio	29 dom	29 mar	29 ven	29 dom	29 mer	29 sab	29 dom	29 mer	29 ven	29 lun	29 mer	29 gio	
30 ven	30 lun	30 mer	30 sab	30 lun	30 gio	30 mar	30 lun	30 gio	30 sab	30 mar	30 ven	30 dom	
31 sab		31 gio		31 mar	31 ven	31 mar	31 mar	31 dom	31 ven	31 gio	31 ven	31 sab	

exams

1st semester

exams

2nd semester

exams

3 - 4 teachings

3 - 4 teachings

LEGENDA

- esami di profitto
- lezioni
- festività
- vacanze
- periodo senza esami, revisioni e recuperi facoltativi per laboratori (design)
- prove in itinere (lezioni sospese)

Example of Weekly Schedule



Data	Dove	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Lunedì	D.1.2							[lezione] ANALOG CIRCUIT DESIGN (dal 17/09/2018 al 17/12/2018)					
	E.G.6		[lezione] CONTROL OF INDUSTRIAL ROBOTS (dal 17/09/2018 al 17/12/2018)										
Martedì	D.0.4			[lezione] ELECTRONIC SYSTEMS (dal 09/10/2018 al 18/12/2018)									
	S.1.3							[lezione] MEMS AND MICROSENSORS (dal 18/09/2018 al 18/12/2018)					
	E.G.8							[esercitazione] MEMS AND MICROSENSORS (dal 09/10/2018 al 11/12/2018)					
	D.0.4		[lezione] MEMS AND MICROSENSORS (dal 09/10/2018 al 18/12/2018)										
Mercoledì	D.1.2					[lezione] ANALOG CIRCUIT DESIGN (dal 19/09/2018 al 19/12/2018)							
	N.1.2							[lezione] MEMS AND MICROSENSORS (dal 19/09/2018 al 19/12/2018)					
	D.1.2		[lezione] CONTROL OF INDUSTRIAL ROBOTS (dal 19/09/2018 al 19/12/2018)										
Giovedì	E.G.2		[esercitazione] ANALOG CIRCUIT DESIGN (dal 20/09/2018 al 20/12/2018)										
	E.G.4				[lezione] ELECTRONIC SYSTEMS (dal 20/09/2018 al 20/12/2018)								
	E.G.1							[lezione] MEMS AND MICROSENSORS (dal 20/09/2018 al 20/12/2018)					
Venerdì	L.26.14							[lezione] ANALOG CIRCUIT DESIGN (dal 21/09/2018 al 21/12/2018)					
	D.1.1		[lezione] ANALOG CIRCUIT DESIGN (dal 21/09/2018 al 21/12/2018)	[lezione] ELECTRONIC SYSTEMS (dal 21/09/2018 al 21/12/2018)									
Sabato													

Insegnamenti selezionati

Visualizza	Legenda	Denominazione Insegnamento	Docente	Cfu	Anno corso	Semestre	Data inizio	Data fine	Rimuovi
Ing. Ind-Inf (Mag.)(ord. 270) - MI (476) Electronics Engineering - Ingegneria Elettronica									
<input checked="" type="checkbox"/>		052427 - ANALOG CIRCUIT DESIGN	Lacaita Andrea Leonardo	10.00	--	1	17/09/2018	21/12/2018	
<input checked="" type="checkbox"/>		088724 - ELECTRONIC SYSTEMS	Zappa Franco	10.00	--	1	20/09/2018	21/12/2018	
<input checked="" type="checkbox"/>		095162 - MEMS AND MICROSENSORS	Langfelder Giacomo	10.00	--	1	18/09/2018	20/12/2018	
<input checked="" type="checkbox"/>		090914 - CONTROL OF INDUSTRIAL ROBOTS	Rocco Paolo	5.00	--	1	17/09/2018	19/12/2018	

Aggiorna

Every week about **24 hours of LESSONS** and **EXERCISES** in class and **3 hours of LABORATORIES**



- Politecnico di Milano: Schools and Masters
 - Electronics and Engineering: what and why?
 - Master Degree in Electronics Engineering



- **Data and Stats**

How many graduates?



B.S.E.E.

M.S.E.E.

Titolo Voto Normalizzato



AA esteso

Titolo Voto Normalizzato



AA esteso

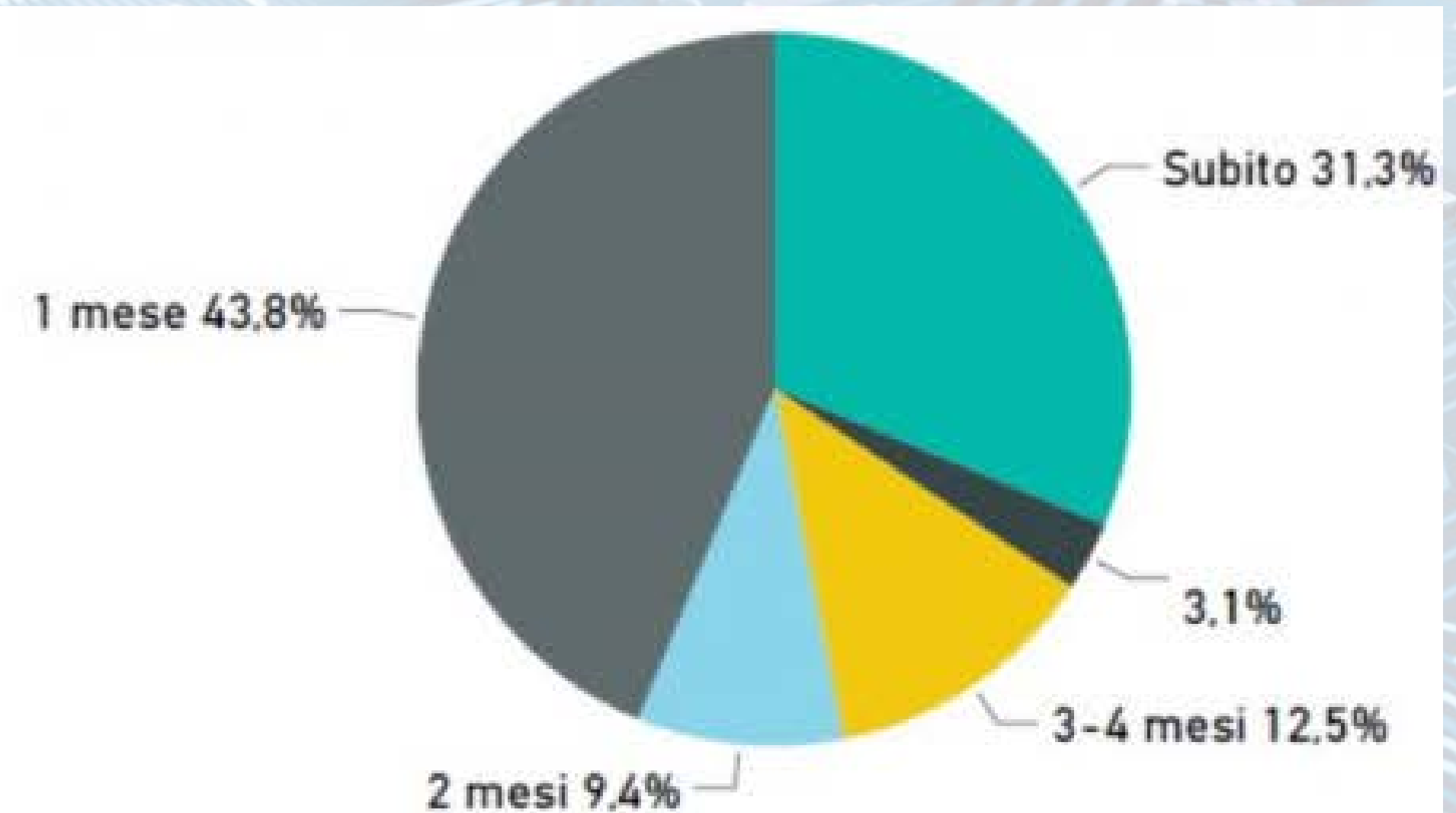
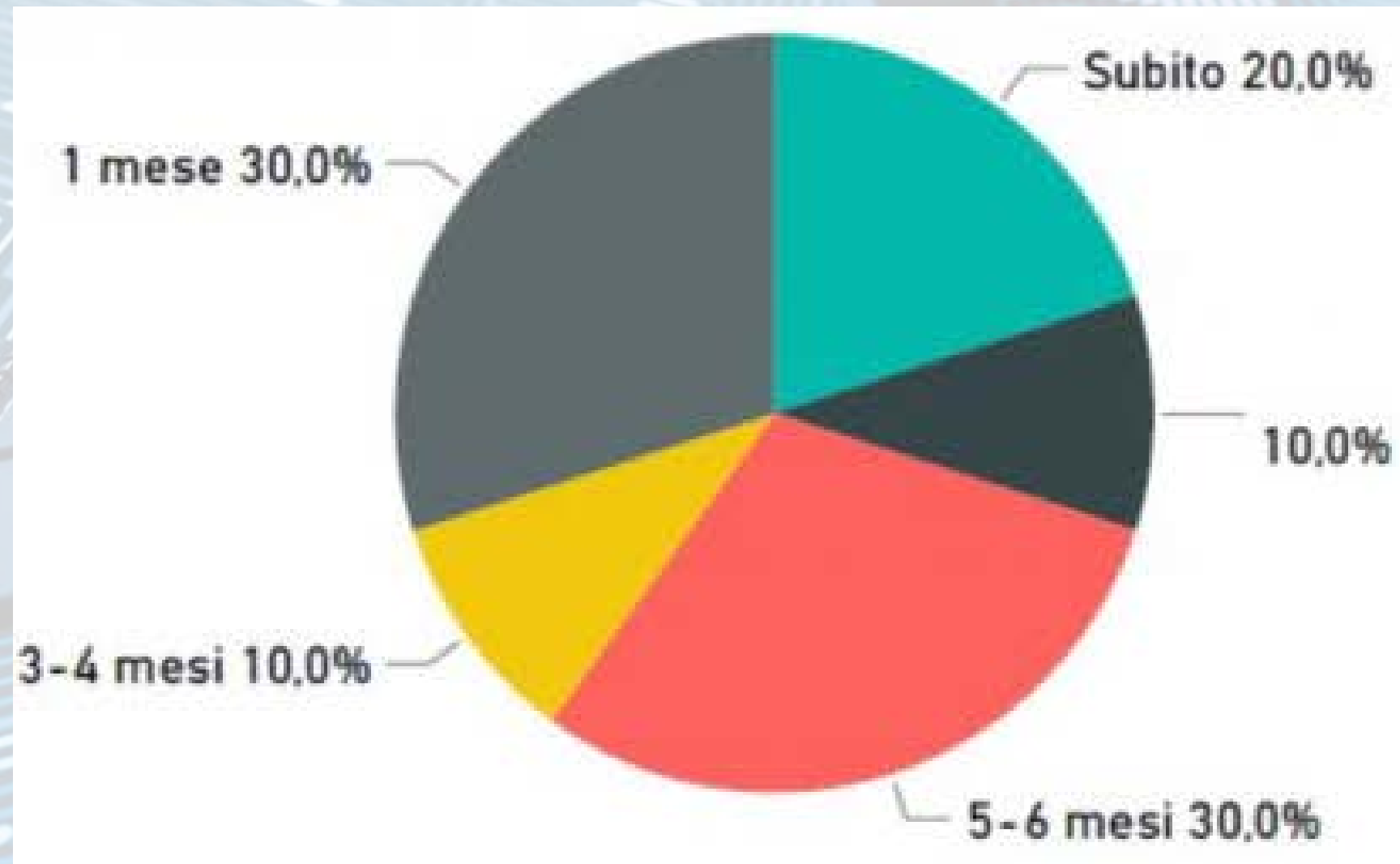
Time to job



Source: www.careerservice.polimi.it

B.S.E.E.

M.S.E.E.

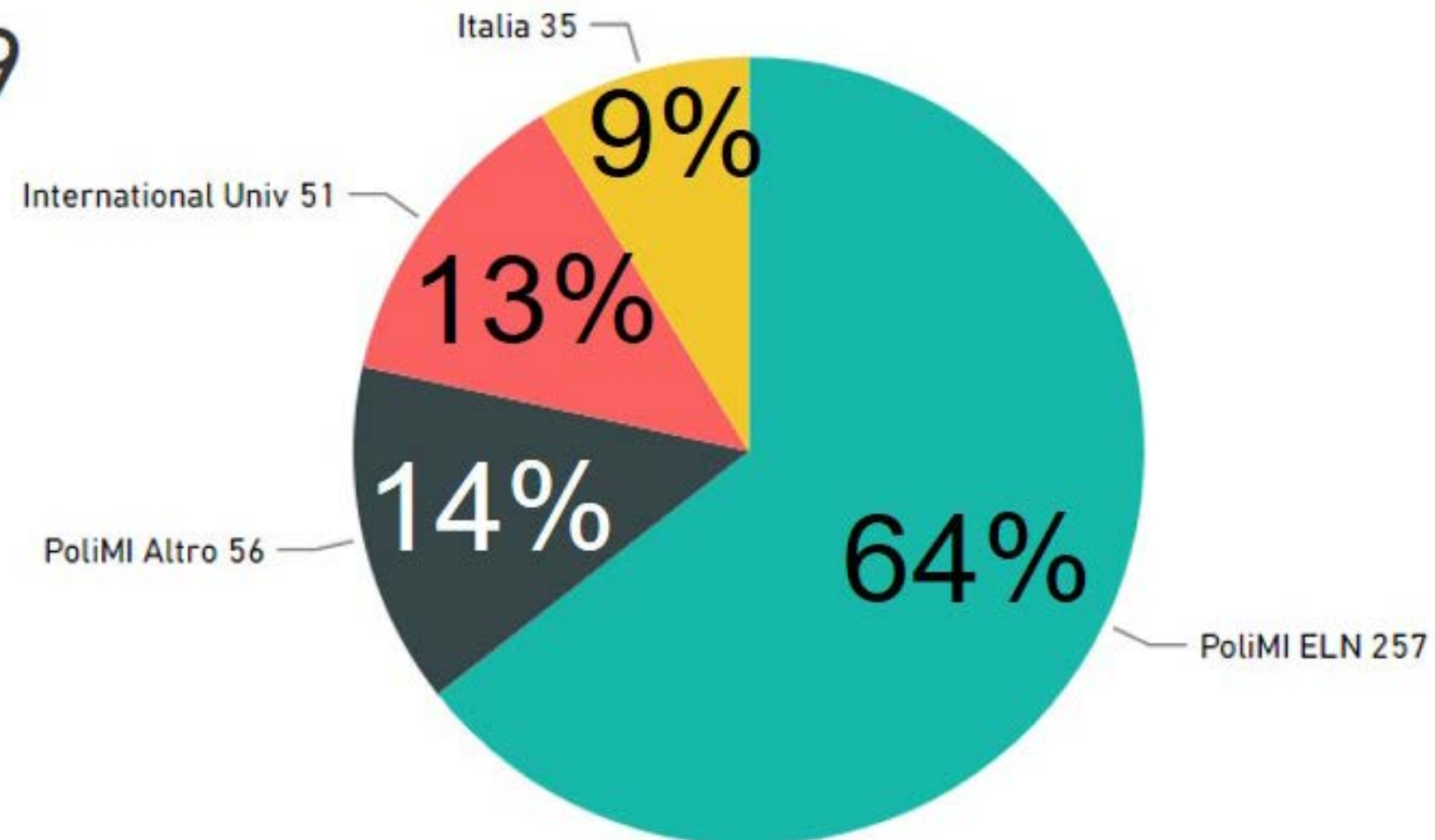


Who are the students?



#Iscrizioni

399



Enrolled students to the M.S.E.E.

Distribution of exams' marks



di Insegnamenti
39

di Iscritti all'Esame
1238

di cui superati
500

% di 30 e Lode
8,00

Voto Medio
26,14

Deviazione Standard
3,10

Corsi Attivi
 Sì

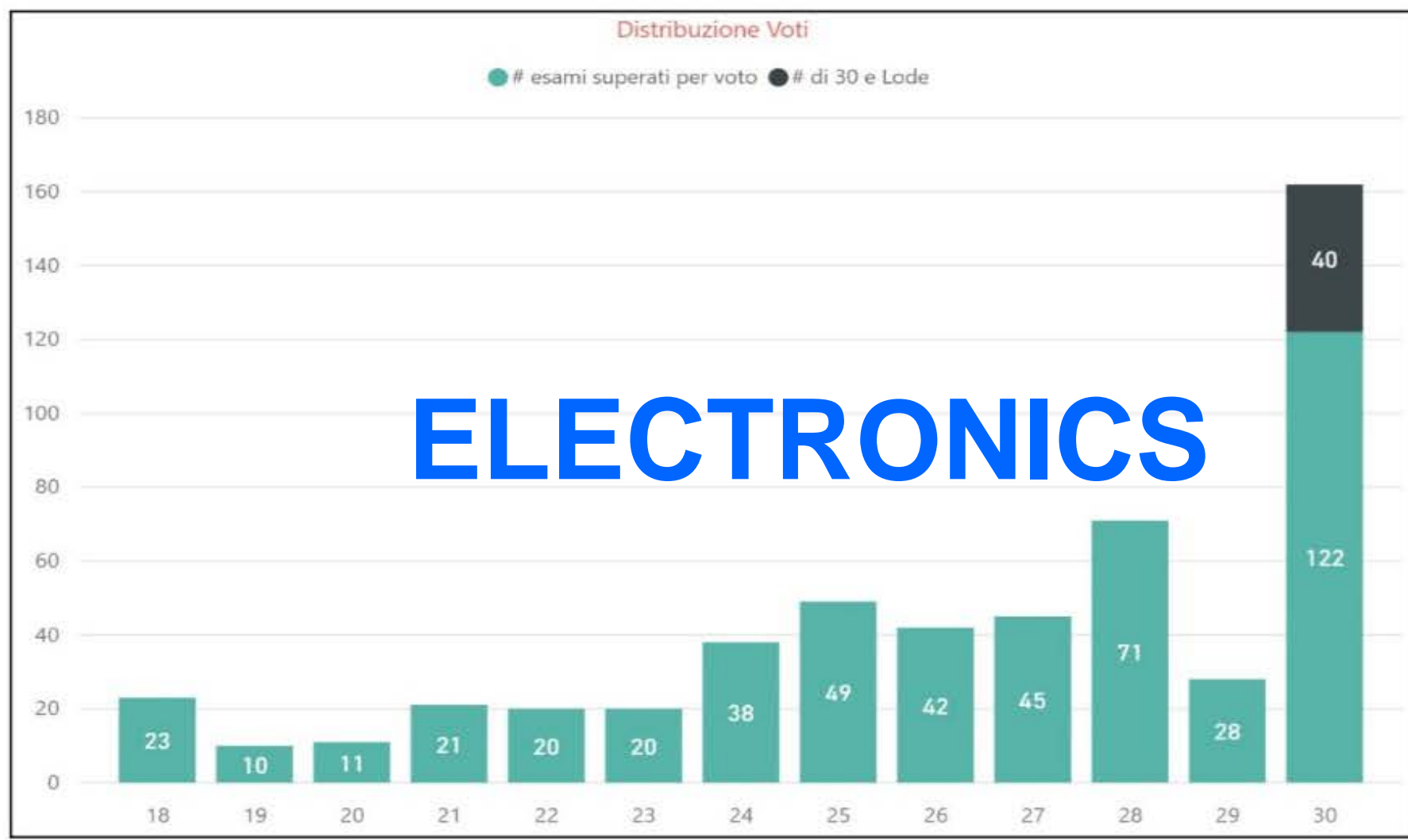
Anno
 2015-16
 2016-17
 2017-18

Tipo Corsi
 LM

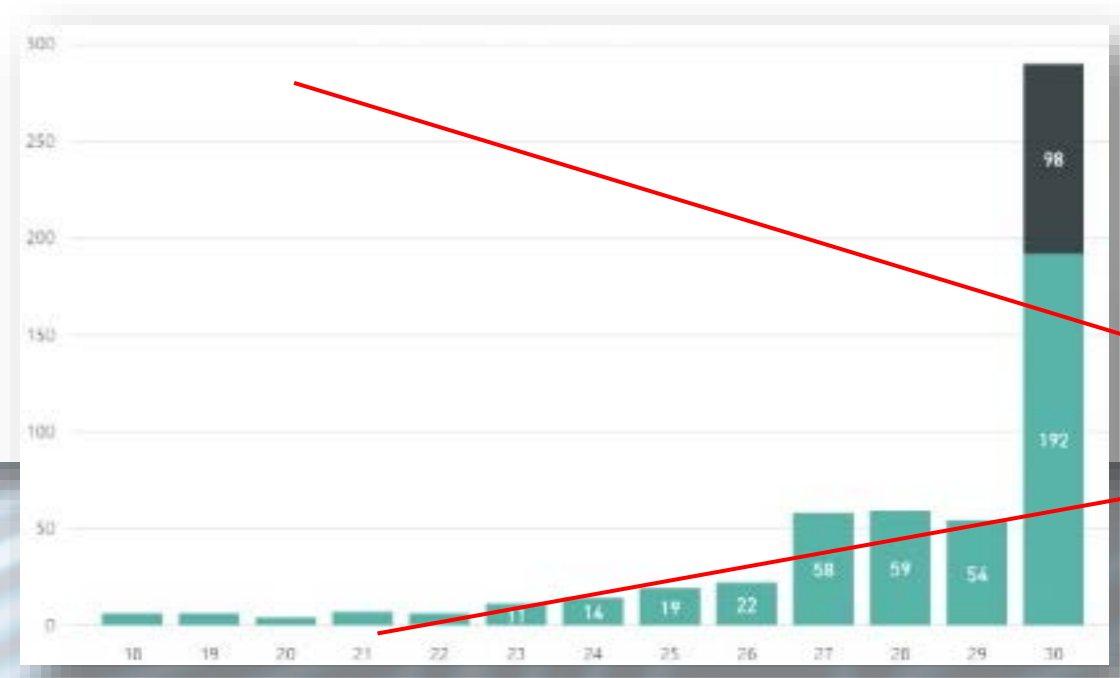
Scuola
 ING_3i

Anno di Corso
 1
 1-2
 2

Corso di Laurea
 Seleziona tutto
 Aeronautical Engineering - Ingegneria ...
 Automation and Control Engineering - I...
 Biomedical Engineering - Ingegneria Bi...
 Chemical Engineering - Ingegneria Chi...
 Computer Science and Engineering - In...
 Electrical Engineering - Ingegneria Elett...
 Electronics Engineering - Ingegneria Ele...
 Energy Engineering - Ingegneria Energ...
 Engineering Physics - Ingegneria Fisica
 Ingegneria della prevenzione e della sic...
 Management Engineering - Ingegneria ...
 Materials Engineering and Nanotechnol...
 Mathematical Engineering - Ingegneria ...
 Mechanical Engineering - Ingegneria M...
 Music and Acoustic Engineering
 Nuclear Engineering - Ingegneria Nucle...



ELECTRONICS



M.S.E.E. employment data

www.careerservice.polimi.it

ELECTRONICS ENGINEERING

Employment Statistics 2019 - Master of Science Graduates

In 2017 71 students (57 Italian and 14 international) obtained the Master's degree in Electronics Engineering. Total respondents to the annual employment survey were 52 (coverage rate 73%).

Graduates' Profile: 21% female and 79% male; average age of graduation: 25,8 years; average duration of studies 2.8 years; average graduation marks: 99.5/110; 24% carried out an internship during their studies.

TOTAL OFFERS: 3571



COMPANY SIZE*



WHERE



CONTRACT TYPE



EMPLOYED*



* 1 year after graduation, except students

EMPLOYED WITHIN 6 MONTHS*

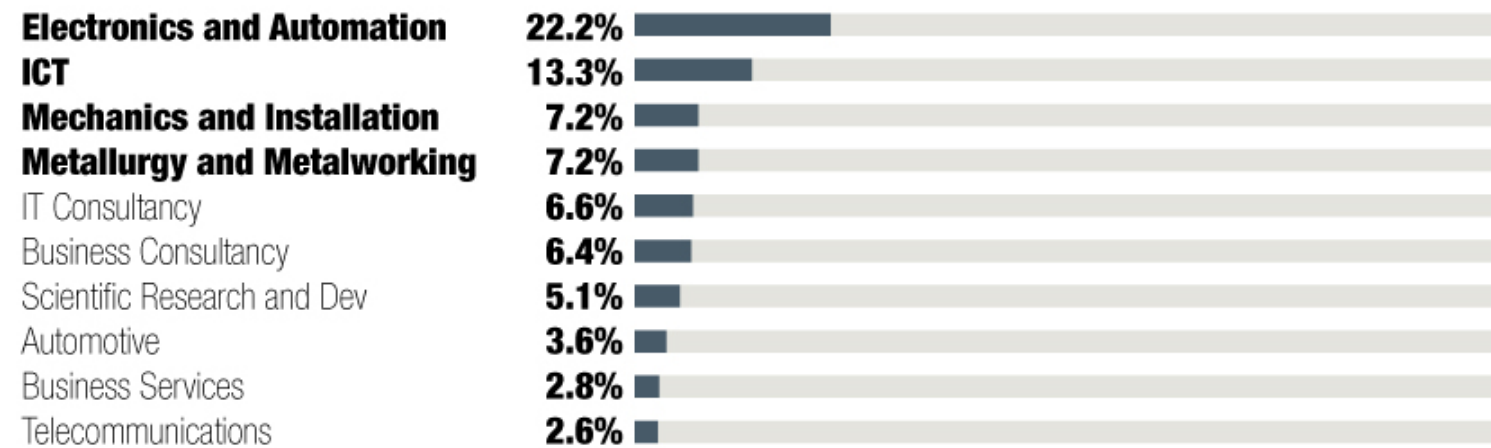


* calculated on employed

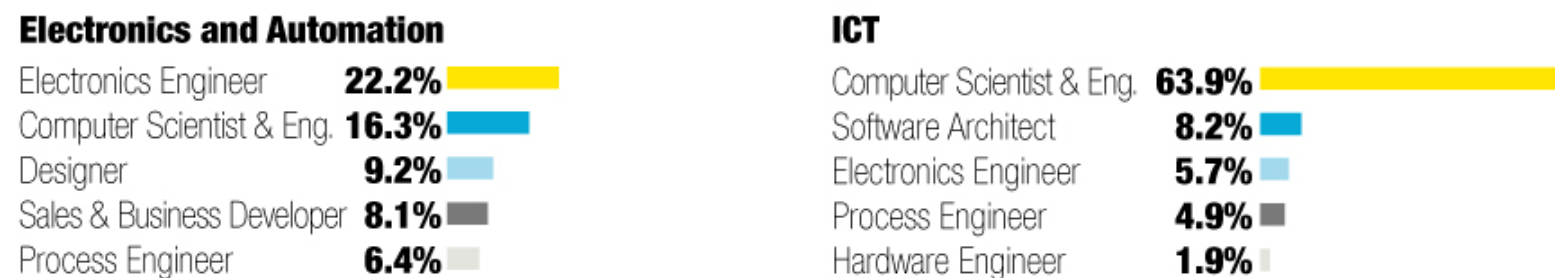
NET MONTHLY SALARY



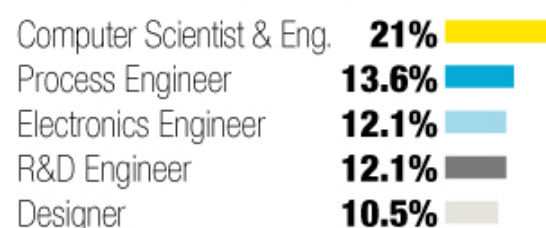
TOP 10 SECTORS



MAIN JOBS OFFERED IN TOP 4 SECTORS



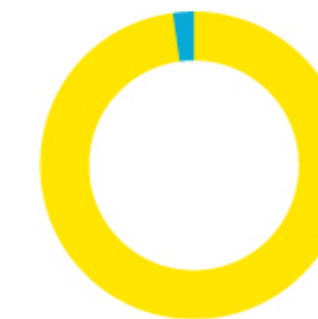
Mechanics and Installation



Metallurgy and Metalworking



EMPLOYMENT STATUS



CONTRACT TYPE



COMPANY SIZE



WHERE THEY WORK



TOP 5 SECTORS



TOP 5 AREAS OF EXPERTISE



Internationalization



POLITECNICO
MILANO 1863

www.polimi.it/it/servizi-e-opportunita/studiare-all'estero



Study abroad committee:

prof.ssa **Federica Foiadelli**

prof.ssa **Flavia Grassi**

dott.ssa **Michela Longo**

(Erasmus, worldwide except China),

(Double degree and exchange with China),

(Double degree, expect China)

Brochure on M.S.E.E.



POLITECNICO
MILANO 1863



POLITECNICO
MILANO 1863

SCUOLA DI INGEGNERIA
INDUSTRIALE E DELL'INFORMAZIONE

Corso di Laurea Magistrale

ELECTRONICS Engineering

Ingegneria ELETTRONICA

Manifesto degli studi



Legenda:

- B – insegnamento "caratterizzante" l'Elettronica.
- C – insegnamento "affine" o attività "integrativa".
- D.I. – Didattica Innovativa (flipped-classroom, blended learning, cotutela con aziende, soft skills o Massive Open Online Courses).
- SSD – Settore Scientifico Disciplinare (ad esempio "INF-INF/01" è "Elettronica").
- CFU – Crediti Formativi Universitari (1 CFU è pari a circa 10 ore in aula e circa 15 ore di studio a casa).

Insegnamenti del 1° Anno di corso

Piano di Studio preventivamente approvato PSS - ELECTRONICS ENGINEERING

Codice	Attività formative	SSD	Denominazione Insegnamento	Lingua	Sem	CFU	CFU Gruppo
052427	B	ING-INF/01	ANALOG CIRCUIT DESIGN	EN	1	10 [1 di D.I.]	10
054654	B	ING-INF/01	ELECTRONIC SYSTEMS	EN	1	10	10
095155	B	ING-INF/01	ELECTRON DEVICES	EN	1	10	10
095162	B	ING-INF/01	MEMS AND MICROSENSORS	EN	1	10	10
095251	B	ING-INF/01	SIGNAL RECOVERY	EN	2	10	10
095264	B	ING-INF/01	DIGITAL INTEGRATED CIRCUIT DESIGN	EN	2	10	10
095274	B	ING-INF/01	RF CIRCUIT DESIGN	EN	2	10	10
054085	B	ING-INF/01	BIOCHIP	EN	2	5 [2 di D.I.]	5
054083	B	ING-INF/01	DIGITAL ELECTRONIC SYSTEMS DESIGN	EN	2	5 [3 di D.I.]	5
--	--	--	Insegnamenti a scelta dal Gruppo TAB1	--	--	--	5

Insegnamenti del 2° Anno di corso

Piano di Studio preventivamente approvato PSS - ELECTRONICS ENGINEERING

Codice	Attività formative	SSD	Denominazione Insegnamento	Lingua	Sem	CFU	CFU Gruppo
095380	B	ING-INF/01	MIXED-SIGNAL CIRCUIT DESIGN	EN	1	10	10
090918	B	ING-INF/01	POWER ELECTRONICS	EN	1	10	10
--	--	--	Insegnamenti a scelta dal Gruppo TAB1	--	--	--	10
054081	B	ING-INF/01	MICROELECTRONIC TECHNOLOGIES	EN	2	5 [1 di D.I.]	10
055519	B	ING-INF/01	RADIATION DETECTION SYSTEMS	EN	2	5	10
090935	B	ING-INF/01	ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUMENTATION	EN	2	10	10
--	--	--	Insegnamenti a scelta dal Gruppo TAB2	--	--	--	10
--	--	--	Insegnamenti a scelta dal Gruppo TAB1	--	--	--	10
090921	--	--	THESIS AND FINAL EXAM	--	1	20	20
090921	--	--	THESIS AND FINAL EXAM	--	2	20	20

Manifesto degli studi



Insegnamenti del Gruppo TAB1

Codice	Attività formative	SSD	Denominazione Insegnamento	Lingua	Sem	CFU
052471	C	ING-INF/03	ADVANCED DIGITAL SIGNAL PROCESSING	EN	1	10 [1 di D.I.]
097589	C	FIS/03	ADVANCED OPTICS AND LASERS	EN	1	10
099282	C	BIO/10	BIOINFORMATICA E GENOMICA FUNZIONALE	IT	1	5
083042	C	ING-IND/34	BIOINGEGNERIA CELLULARE	IT	1	10
073011	C	ING-INF/06	BIOINGEGNERIA DEL SISTEMA MOTORIO	IT	1	5
090914	C	ING-INF/04	CONTROL OF INDUSTRIAL ROBOTS	EN	1	5
055520	B, C	ING-INF/04 ING-INF/07	OPTICAL MEASUREMENTS	EN	1	5
096617	C	FIS/03	PHYSICS OF PHOTOVOLTAIC PROCESSES	EN	1	5
055552	C	ING-INF/03	RADAR IMAGING	EN	1	5 [1 di D.I.]
052577	C	ING-IND/32	SISTEMI PER L'AUTOMAZIONE E LA COMUNICAZIONE INDUSTRIALE	IT	1	5
054312	C	ING-INF/03	DIGITAL COMMUNICATION	EN	1	10 [2 di D.I.]
095907	C	ING-INF/05	EMBEDDED SYSTEMS	EN	1	10
052351	C	ING-INF/04	MODEL IDENTIFICATION AND DATA ANALYSIS	EN	1	10
096532	C	ING-IND/31	ADVANCED CIRCUIT THEORY	EN	2	5
088949	C	ING-INF/05	ADVANCED COMPUTER ARCHITECTURES	EN	2	5
093062	C	ING-INF/04	AUTOMATION AND CONTROL IN VEHICLES	EN	2	5
095947	C	ING-INF/05	CRYPTOGRAPHY AND ARCHITECTURES FOR COMPUTER SECURITY	EN	2	5
055521	C	ING-IND/31	ELECTROMAGNETIC COMPATIBILITY C	EN	2	5 [2 di D.I.]
096660	C	MAT/08	NUMERICAL METHODS IN MICROELECTRONICS	EN	2	5
052470	C	ING-INF/03	QUANTUM COMMUNICATIONS	EN	2	5
096081	C	FIS/03	QUANTUM OPTICS AND INFORMATION	EN	2	5
089480	C	FIS/03	SOLID STATE PHYSICS A	EN	2	5
083047	C	ING-IND/34	BIOMATERIALI [C.I.]	IT	2	10
095942	C	ING-INF/05	DIGITAL SYSTEMS DESIGN METHODOLOGIES	EN	2	10

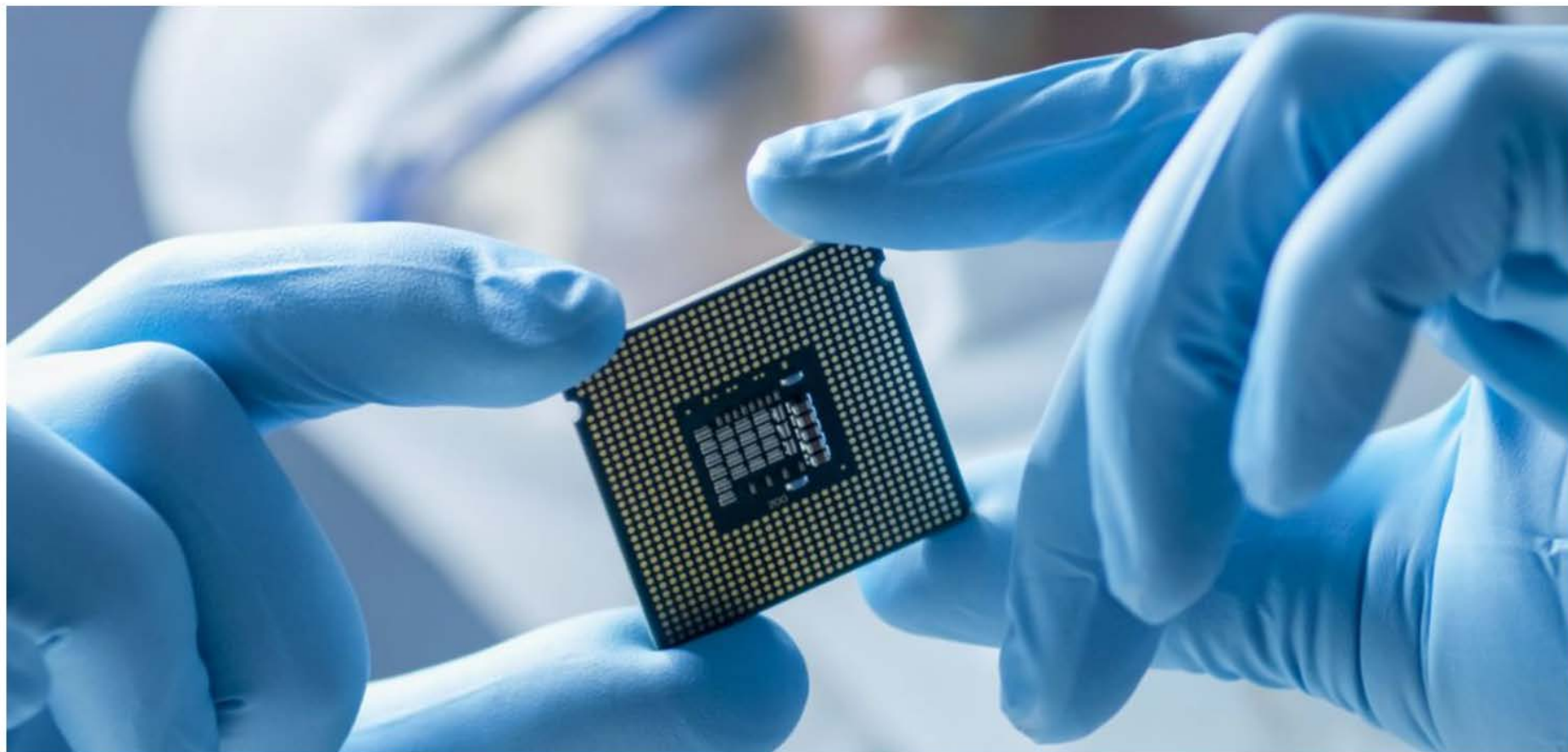
Insegnamenti del Gruppo TAB2

Codice	Attività formative	SSD	Denominazione Insegnamento	Lingua	Sem	CFU
095155	B	ING-INF/01	ELECTRON DEVICES	EN	1	10
095162	B	ING-INF/01	MEMS AND MICROSENSORS	EN	1	10
095380	B	ING-INF/01	MIXED-SIGNAL CIRCUIT DESIGN	EN	1	10
090918	B	ING-INF/01	POWER ELECTRONICS	EN	1	10
054184	B, C	ING-INF/07	RELIABILITY DESIGN	EN	1	5
052484	B, C	ING-INF/02	RF SYSTEMS	EN	1	10 [1 di D.I.]
054092	B	ING-INF/01	SENSOR SYSTEMS	EN	1	5 [3 di D.I.]
054321	B, C	ING-INF/02	ANTENNAS	EN	2	5 [1 di D.I.]
054085	B	ING-INF/01	BIOCHIP	EN	2	5 [2 di D.I.]
054083	B	ING-INF/01	DIGITAL ELECTRONIC SYSTEMS DESIGN	EN	2	5 [3 di D.I.]
095264	B	ING-INF/01	DIGITAL INTEGRATED CIRCUIT DESIGN	EN	2	10
090935	B	ING-INF/01	ELECTRONICS DESIGN FOR BIOMEDICAL INSTRUMENTATION	EN	2	10
054081	B	ING-INF/01	MICROELECTRONIC TECHNOLOGIES	EN	2	5 [1 di D.I.]
094791	B, C	ING-INF/02	MICROWAVE ENGINEERING	EN	2	5
096115	B, C	ING-INF/02	PHOTONIC DEVICES	EN	2	10
055519	B	ING-INF/01	RADIATION DETECTION SYSTEMS	EN	2	5
095274	B	ING-INF/01	RF CIRCUIT DESIGN	EN	2	10
052834	B	ING-INF/01	ELECTRONICS AND ELECTROACOUSTICS FOR SOUND ENGINEERING	EN	2	10

More info at:

www.poliorientami.polimi.it/fileadmin/user_upload/open_day_virtuale_2020/ingegneria_elettronica/Ingegneria_Elettronica_OpenDay_Brochure.pdf

Electronics Engineer



The Study Programme (Corso di Studi, CdS) in Electronics Engineering trains the student to design, use, and innovate electron devices, circuits and systems, to guide the evolution of this technological field with competence and professionalism, and to promote its deployment in countless sectors and in most diversified applications, where Electronics plays a key role. The objective of the Study Programme in Electronics Engineering is to train professionals with a rich and robust scientific and technological background, which combine physical-chemical-mathematical understanding of the most advanced technologies with cutting-edge engineering skills, necessary to conceive, design, and develop applications, products, and systems to be deployed in the most diversified fields, often enabling new markets and inventing new application scenarios.

““Electronics Engineering is at the basis of all technologies in today’s Information age, fostering all aspects of life, work, and society.””

Research in electronics technologies is continuous, incessant, and increasingly stimulated by the most diverse and demanding applications. For example, ever-faster microprocessors and increasingly dense memories are the essential electronic constituents of any computer and processing system. Ultra-sensitive and miniaturized semiconductor sensors, which continually dialogue with each other and with the outside world, are fundamental to acquire real world’s signals. Embedded systems can understand, manage, and control objects around us and can implement actions through drones and robots. Not to speak of the ubiquitousness of electronic systems in telecommunications, where the development of ever faster and more complex electronic circuits enabled the explosion of cellular, fiber optic, and satellite communications.

Information events

The School of “Industrial and Information Engineering” organizes several information and guidance events each year, in order to explain to interested students what Engineering is and what the various Study Programmes are.

In particular, both the Bachelor of Science (i.e., the three-years “Laurea”) and the Master of Science (i.e., the two-years “Laurea Magistrale”) Degrees in **Electronic Engineering** have been actively presented at the following events:

- [“OPEN DAYS 2020”](#) (held online on April 27, 2020), addressed to Italian high-school students interested in the Bachelor’s first level degree in “Electronic Engineering”; [video about the study programme](#) and [students interview](#).
- [“POLIMI e Scuola di INGEGNERIA INDUSTRIALE e dell’INFORMAZIONE”](#) and also [“Ingegneria ELETTRONICA”](#) (held on December 2, 2019, in Italian), addressed to students of the Scientific and Technical High School of Salesiani in Sesto San Giovanni;
- [“ELECTRONICS ENG.: Study Programme’s Quality Assurance”](#) (held on October 31, 2019) to students at the second year of the M.S.E.E., on AQ (Quality Assurance), AVA procedure (Self-evaluation, periodic Evaluation, Accreditation), proactive role of students, Students’ Representatives within the Study Programme’s Council and within the Joint Professors-Students Committee.
- [“QUALITY ASSURANCE”](#) (held on October 9, 2019) to students at the M.S.E.E. providing an overview on “Bologna process”, AQ (Quality Assurance), AVA (Autovalutazione, Valutazione periodica e Accreditamento, i.e. self-evaluation, periodic evaluation, and Accreditation) procedure, role of MIUR (Italian Ministry of Education, University and Research), role of ANVUR (Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca, Italian evaluation agency for university and research), and periodic visit of CEV (Commissione di Esperti della Valutazione, evaluation experts committee).
- [“LESSON ZERO”](#) (held on October 3, 2019) to students at the M.S.E.E., providing an overview on POLIMI, Schools, Departments, Organization, Students’ role, Services and Opportunities and Contact persons, M.S.E.E. programme, courses and credits, thesis typologies and evaluations, internal and external thesis, final grade, thesis topics on the research developed at POLIMI on Electronics.
- [“LEZIONE ZERO”](#) (held on September 27, 2019) to freshmen at the first year of the Laurea (B.S.E.E.), providing an overview on POLIMI, Schools, Departments, Organization, Students’ role, Services and Opportunities and Contact persons, B.S.E.E. programme, courses and credits, internship;
- [“WELCOME DAY 2019”](#) (held on September 11, 2019), addressed to international students enrolling to the Master of Science in “Electronics Engineering” (M.S.E.E., i.e. the “Laurea Magistrale”);
- [“SUMMER SCHOOL 2019”](#) (held on June 11, 2019), addressed to the best students of the second-to-last year of secondary high schools in Italy, illustrating the Study Programmes of both Laurea (B.S.E.E.) and Laurea Magistrale (M.S.E.E.) in Electronic Engineering at POLIMI;
- [“MASTERS’ Degrees at POLIMI 2019”](#) (held on May 14, 2019), addressed to first-level B.S. students interested to apply to the second-level Master’s Degree (LM) in “Electronics Engineering”;
- [“ELECTRONICS”](#), a brief review of some applications of electronics in everyday’s life;



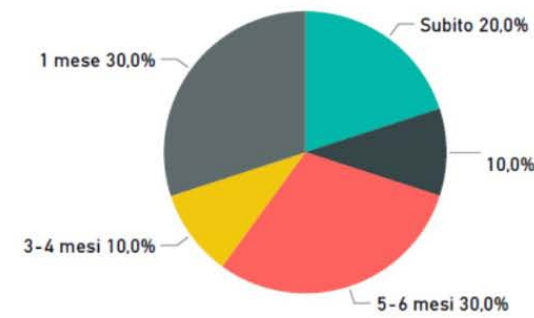
HOME PROGRAM PROSPECTIVE STUDENTS ENROLLED STUDENTS **JOBS** CONTACTS PROFESSORS RESEARCH

The ratio between students and teachers is between 10 and 13 and the values of the indicators of the teachers quality, according to the parameters of the MIUR, are between 1.1 and 1.2, compared to an average of 1.0 of other universities in the same geographical area. The overall percentage of satisfied undergraduates in the B.S.E.E.'s degree programme is between 84% and 88%.

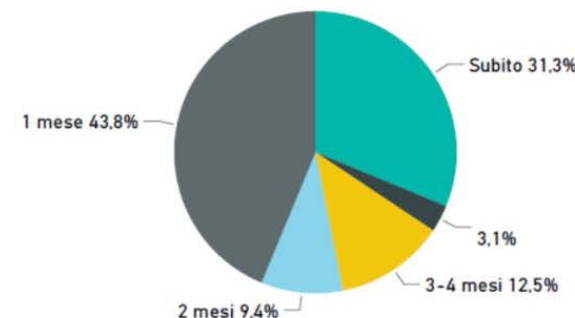
The percentage of female students (15%) is in line with other Study Programmes (10% Mechanical Eng., 14% Computer Science, 15% Aerospace Eng.), but it is low and with no motivation, leaving ample room for better gender balance.

"As confirmed by many companies, the employment rate of EElectronics Engineers within four months after graduation is 97% for the Laurea Magistrale M.S.E.E.'s Degree, of which more than 70% within one month. "

ESITI OCCUPAZIONALI LT
ULTIMO AGGIORNAMENTO: 13 OTT 2019, 21:40:02



ESITI OCCUPAZIONALI LM
ULTIMO AGGIORNAMENTO: 13 OTT 2019, 21:40:02



It is also interesting to note that the first average salary (1,807 €) is higher than the average of other Master's degree at POLIMI (1,600 €).

GRADUATE EMPLOYMENT: MSC GRADUATES

EMPLOYMENT RATE* 100%	WITHIN 6 MONTHS* 91%	NET MONTHLY SALARY €1,807
EMPLOYEES 98%	CONTRACT TYPE*	COMPANY SIZE*
WHERE THEY WORK	TOP 5 SECTORS	TOP 5 AREAS OF EXPERTISE
SATISFIED WITH SPECIFIC DEGREE: 87%		

HOME CORSO STUDENTI FUTURI STUDENTI ISCRITTI **LAVORO** CONTATTI DOCENTI RICERCA

Alumni

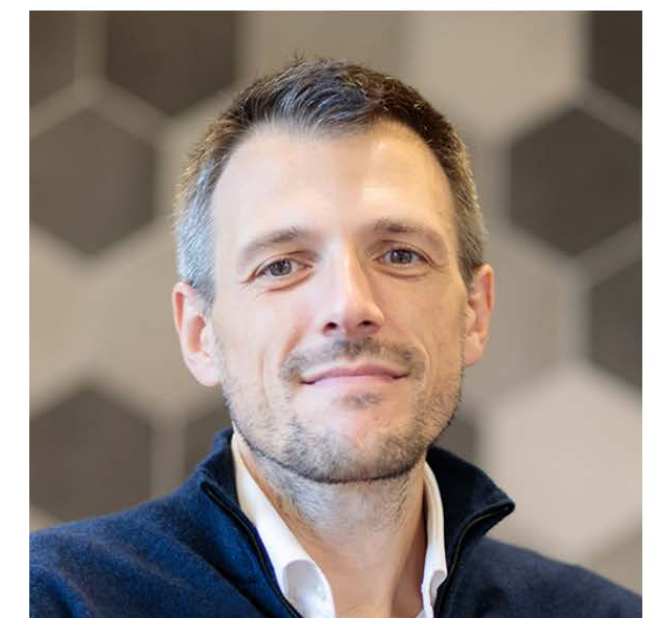
Here are some of our former graduated students, who reached outstanding positions in different fields and environments, both in Italy and abroad. As you can see, Electronics engineers boost excellence everywhere!

Alberto Sangiovanni-Vincentelli. I was born in Milano in 1947. I received an MS in Electronic Engineering cum laude from Politecnico di Milano in 1971. After graduation, I joined the Department of Electronic Engineering as a researcher first and then as a Professore Incaricato. In 1975, I joined Electrical Engineering and Computer Sciences at the University of California, Berkeley, where I hold the Edgar L. and Harold H. Buttner Chair. Among various visiting positions, I was at IBM T.J. Watson Research Center in 1980 and at MIT in 1987. In 2001, I received the Kaufman Award for my pioneering contributions to EDA from the Electronic Design Automation Consortium. In 2011, I was awarded the IEEE/RSE Maxwell Medal "for groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields". I co-founded Cadence and Synopsys, listed in NASDAQ with market cap of over 40 Billion USD. I presently serve on the Board of Directors of Cadence Design Systems, KPIT (India), Cogisen, ISEO, Expert System (Italy), and UltraSoC (UK) (Chairman of the Board). I consulted for, among others, Intel, HP, TI, ST Microelectronics, Mercedes, BMW, Magneti Marelli, Telecom Italia, United Technologies, Camozzi Group, Pirelli, General Motors, UniCredit and UnipolSAI. I had been the President of Comitato Nazionale dei Garanti per la Ricerca and President of the Strategy Committee of the Fondo Strategico Italiano. I am also serving as member of the Advisory Board of the Politecnico di Milano, and as Chairman of the International Advisory Council of MIND (Milano Innovation District). I am a member of the United States National Academy of Engineering, an IEEE and ACM Fellow. I received an honorary Doctorate from Aalborg University (Denmark) and one from KTH (Sweden). I published more than 950 papers and 19 books.



Alberto Sangiovanni Vincentelli

Mario Caironi was born in Bergamo (Italy) in 1978. He studied at "Politecnico di Milano" (Milan, Italy) where he obtained his Laurea degree in Electrical Engineering in 2003 and a Ph.D. in Information Technology with honours in 2007, with a thesis on organic photodetectors and memory devices. In March 2007 I joined the group of Prof. Henning Sirringhaus at the Cavendish Laboratory (Cambridge, UK) as a post-doctoral research associate. I worked in Cambridge for 3 years on high resolution inkjet printing of downscaled organic transistors and logic gates, and on charge injection and transport in high mobility polymers. In April 2010 I was appointed as a Team Leader at the Center for Nano Science and Technology@PoliMi of the Istituto Italiano di Tecnologia (Milan, Italy). In 2014 I entered the tenure track at the same institution, securing a tenured Senior Researcher position in 2019. I am currently responsible of the "Printed and Molecular Electronics" research line and my group is currently composed of 7 postdocs, 8 PhD students and 1 fellow researcher. I am author and co-author of more than 120 scientific papers in international journals and books. I have an h-index of 35 (Scholar - July 2019). I am currently interested in solution based high resolution printing techniques for micro-electronic, opto-electronic and thermoelectric devices fabrication, in the device physics of organic semiconductors based field-effect transistors and their integration in high-frequency printed circuits, and in biomedical and/or implantable sensors and electronics for the healthcare. I am an 2014 ERC grantee. My double-E master degree at POLIMI was key to the rest of my career. When I joined the Cavendish Labs, I immediately teamed with chemists and physicists who were developing the fastest polymer transistor at that time. They did not know how to measure it. I went back to my university notes, and found very soon the solution. A few months later we published a paper that is still, after 10 years, a milestone in polymer electronics. I believe that as research fields become more and more inter- and multi-disciplinary, with impact on healthcare and personalized medicine, it is even more important to hold solid basis in one sector to be able to make a difference: and Electronics is everywhere! As such, a double-E degree will give you the keys to many future technologies.



Mario Caironi



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