

Master Program in Navigation and Related Applications in Torino

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ICG Bangalore 4-7 September 2007

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M. Boella
ISMB
Istituto Superiore Mario Boella

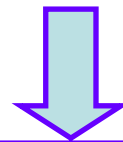
Outline

- 1 – Why a Master on Global Navigation Satellite Systems (GNSS) ?**
- 2 – Overview of the Master Program**
- 3 – Details on the UN/Italy Fellowship Programme**
- 4 – Conclusions**



Why a Master on GNSS ?

- **GALILEO** will be the European Global Navigation Satellite System expected to be in operation in **2012**
- **Boost for research** in the field in GNSS in Europe
- Skilled personnel required for the development and management of innovative **navigation-related applications**



need for educational programs on GNSS in Europe

A joint initiative on education

The Master is a **joint initiative** of

Politecnico di Torino



Istituto Superiore Mario Boella

with the cooperation of

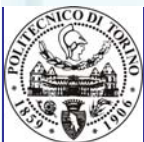
INRIM Galileo Ferraris

and UN OOSA



United Nations

**Office for Outer
Space Affairs**



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Politecnico di Torino

- The oldest Technical University in Italy (founded in 1859)
- About 24.600 **students**:
 - 17.900 Engineering
- **Staff**:
 - 863 professors & researchers
- 4 faculties in **engineering** with 24 curricula and degrees.
- 2 faculties in **architecture** with 7 curricula and degrees.
 - 18 Departments
 - 35 Doctoral school curricula



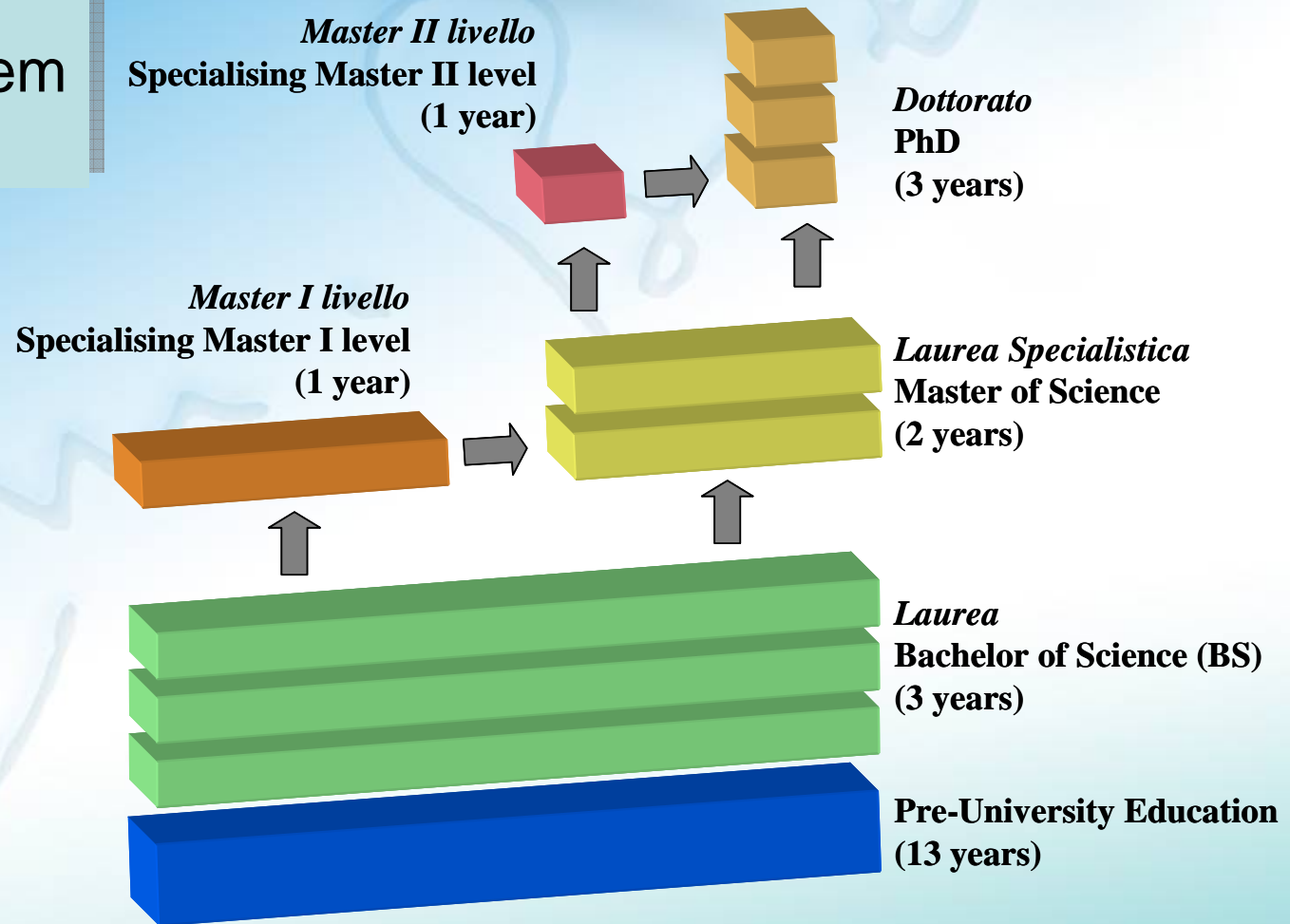
Istituto Superiore Mario Boella (ISMB)

- Non-profit research institute
- **Mission:** Empowerment of ICT research, high level training/education and business intelligence
- **8 Labs** in partnership with Politecnico
- **Goals:**
 - Promote a **strong integration** between ICT operators on highly innovative programs and projects
 - Achieve **synergy** between university and socioeconomic system



Structure of Education in Italy

The Italian University system after 1999



Overview of the Master Program

Requirements for Admission

Students with a **5-year** university curriculum

Degree on:

❖ **Information Technology**

➤ Electronic Engineering

➤ Communications Engineering

❖ **Aerospace** Engineering

❖ **Environmental** Engineering

Good knowledge of **English language**



Overview of the Master Program

The Masters lasts 1 year:

- 12 classes over 3 quarters (50 ECTS)
- The fourth quarter devoted to an internship to be carried out in a company (30 ECTS)



- GNSS introduction
- Timing in navigation systems
- Timescales in GPS and Galileo
- Software radio receivers
- GPS and Galileo Receivers
- Synchronization (PLL, carrier phase, etc..)

12 ECTS

Navigation systems and DSP
 signal processing
 geomatics and orbits
 11 ECTS

- Integration between GNSS and cellular location systems
- Environmental effects

16 ECTS

- Algorithm and instruments for timescale generation
- Synchronisation and automatic measurements

16 ECTS



Details on UN/Italy Fellowship

“Istituto Superiore Mario Boella (*ISMB*) and *Politecnico* di Torino of Italy have established a Long Term *Fellowship Programme* which will provide scientists and specialists from *developing countries* with an opportunity to receive a *Master Degree in Navigation and Related Applications*.“

United Nations Vienna, June 2004

The fellowship is therefore the possibility for ***students selected by United Nations*** to attend the Master



Details on UN/Italy Fellowship

The agreement among Politecnico di Torino, ISMB and UN-OOSA covers the following aspects:

The program of the courses has been prepared by the Masters Scientific Committee and discussed with UN-OOSA representatives.

The 5 students selected by UN receive a scholarship by ISMB to attend the Master.

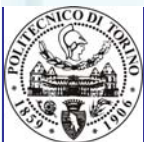
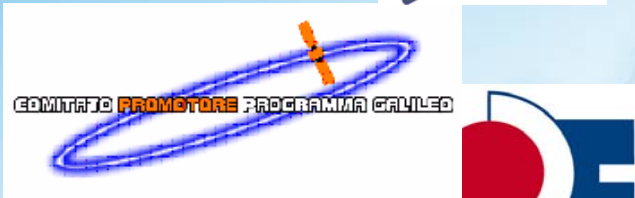
The Masters programme has been promoted through the website and in all the UN Regional Educational Centres. The Masters programme has been organised with the co-operation of officers of UN-OOSA.

Students are selected yearly by UN through the UN Regional Educational Centres.



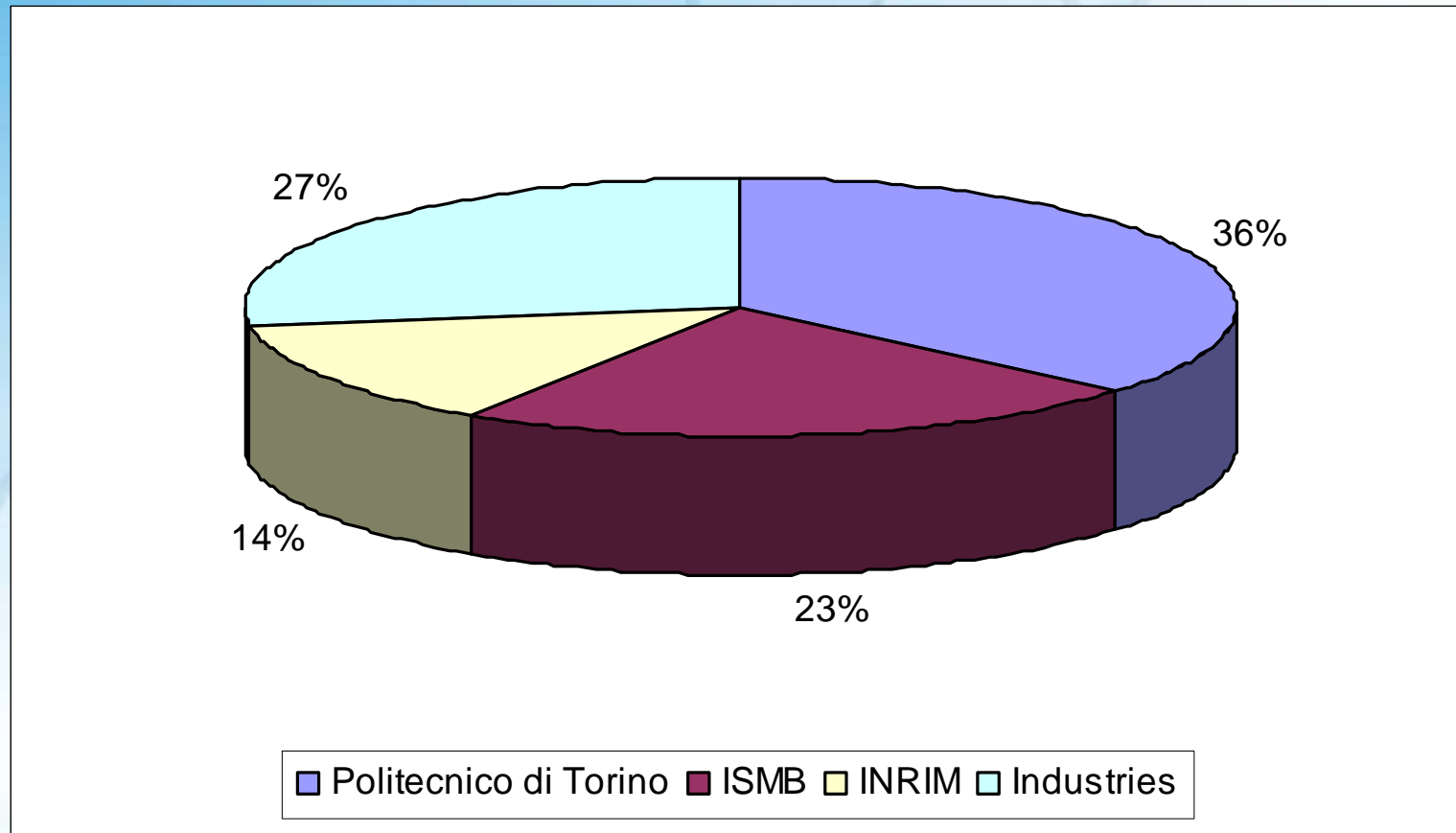
The academia-industry interaction

But also industries and international bodies contribute to the Master with scholarships, lessons, and seminars:



The academia-industry interaction

Teachers' affiliation



The first three editions

UN/ISMB Project

Country	Students/ Edition
Pakistan	2/1,3
Sri Lanka	1/1
Jordan	1/1
Ghana	1/1
Iran	1/2
Algeria	1/2
Nigeria	2/1,2
Georgia	1/3
Vietnam	1/3
Mexico	1/3

ALPIP Project

Country	Students/ Edition
Argentina	1/1
Brazil	1/1
Ecuador	1/1
Mexico	1/2
Colombia	1/3

ASIAN Project

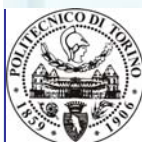
Country	Students/ Edition
Indonesia	1/1
Vietnam	1/1

National funds

Country	Students/ Edition
France	2
Italy	13/1,2,3

JEAGAL Project

Country	Students/ Edition
China	6/2
Vietnam	4/2



Final comments

- Students **actively participate** to the course activities
- Seminars offered by industries and international bodies were **enthusiastically welcome** by the students
- Students obtained **good results** in their examinations
- Students coming from so different countries and cultures succeeded in **interact and integrate** their experience with very **positive results** in intellectual and cultural exchanges
- About all the graduated students are now **working** in the field



Information on:

<http://didattica.polito.it/master/navigation>

<http://www.oosa.univienna.org>

Email to:

Master.universitari@polito.it



