



Aeronautics Institute of Technology
Turbomachines Department

UNESCO UNITWIN Network

Innovative, Sustainable and Clean
Energy Research and Education

Presenting author: Prof. Dr. Cleverson Bringhenti



United Nations
Educational, Scientific and
Cultural Organization



- UNESCO Chair on Innovative Sustainable Clean Energy Research and Education at the University of Genoa, Italy
-



Aeronautics Institute of Technology (ITA)



Belonged to Brazilian Air Force
Ministry of Defence

Created with a strong group of international
professors, based on the MIT (Institute of
Technology) course structure and academic model

About 667 undergraduate students
(six Engineering undergraduate courses)

About 1,187 graduate students
(six graduate programs)

About 200 PhD professors

Located in São José dos Campos, State of São Paulo
(100 km from São Paulo city)



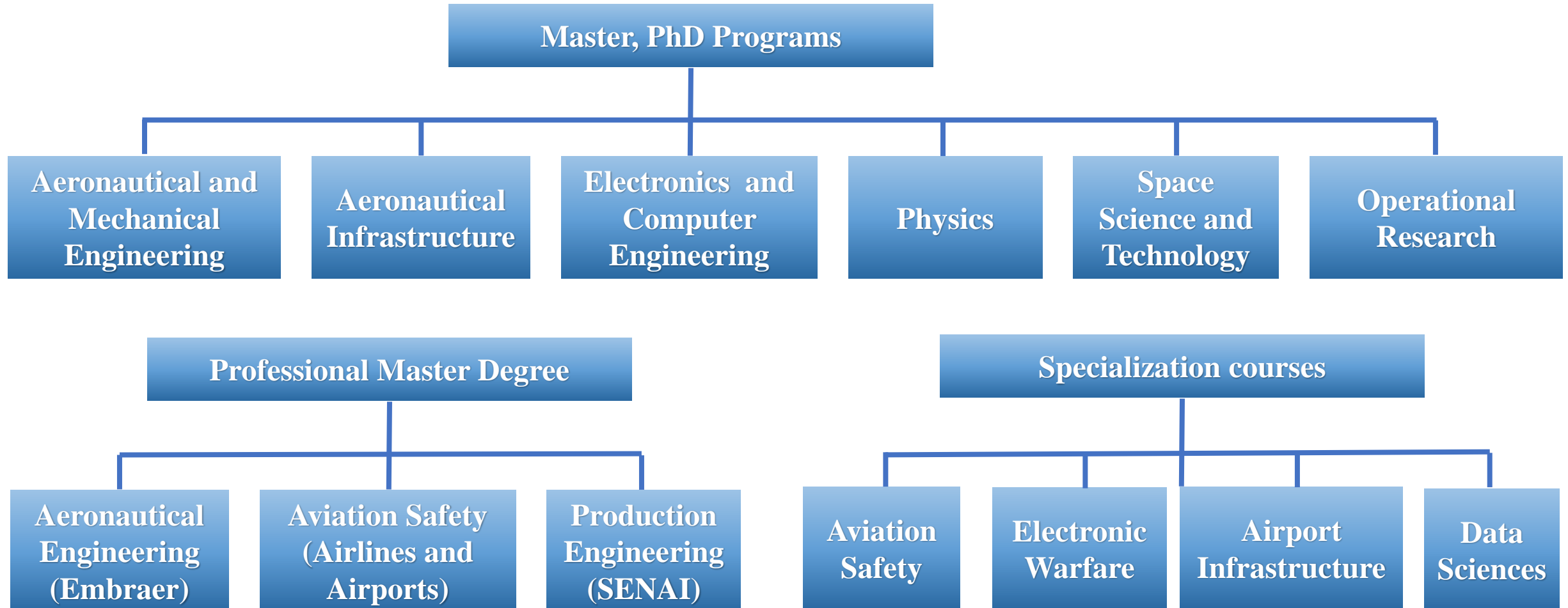
**Established
in 1950**



<https://www.google.com.br/maps/place/Instituto+Tecnol%C3%B3gico+de+Aeron%C3%A1utica/@-23.4645227,-45.7930949,9.5z/data=!4m5!3m4!1s0x935a3ae31c32c515:0x3de6478f4b0657c4!8m2!3d-23.2108714!4d-45.8753055>



Graduate Activities



Internationalization Program - Main Research Areas and Sub-areas

Green Aviation

- New Concepts in Aeronautics
- Propulsion
- Manufacturing
- Materials

Autonomous Systems

- Autonomy and Embedded Systems
- C4I and Cyber Security
- Data Science

Space and Fundamental Sciences

- Space Science and Engineering
- Systems and Logistics Engineering
- Physics
- Nano-materials and Surface Engineering

Mobility and Sustainability

- Air Traffic
- Sustainable Energy
- Sustainable Building



Aeronautics Institute of Technology (ITA)



International Cooperation – American, Asia and Africa



UNIVERSIDAD DE SAN BUENAVENTURA



中国民航大学
Civil Aviation University of China

Established in collaboration with MIT



----- Double Degree in negotiation

©ipr 2021

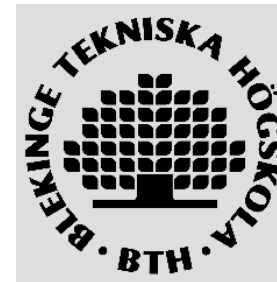
Innovative, Sustainable and Clean Energy Research and Education UNESCO Chair Launch Event – 14th June 2021



Aeronautics Institute of Technology (ITA)



International Cooperation – Europe



©ipr 2021

Double Degree going on

Innovative, Sustainable and Clean Energy Research and Education UNESCO Chair Launch Event – 14th June 2021



Aeronautics Institute of Technology (ITA)



International Cooperation – Europe



UNIVERSITA
DEGLI STUDI
DI TORINO



United Nations
Educational, Scientific and
Cultural Organization

UNESCO Chair on Innovative
Sustainable Clean Energy
Research and Education at
the University of Genoa, Italy



©ipr 2021

--- Double Degree in negotiation
— Double Degree going on



Staff – UNESCO Chair



Prof. Dr. **Cleverson** Bringhenti
cleverson@ita.br
Turbomachines Department



Prof. Dr. Jesuíno **Takachi** Tomita
jtakachi@ita.br
Turbomachines Department



Instructor, PhD student, lieut.
Lindquist
luizhlw@ita.br
Turbomachines Department



Prof. Dr. **Guilherme** Borges
Ribeiro
gbribeiro@ita.br
Energy Department



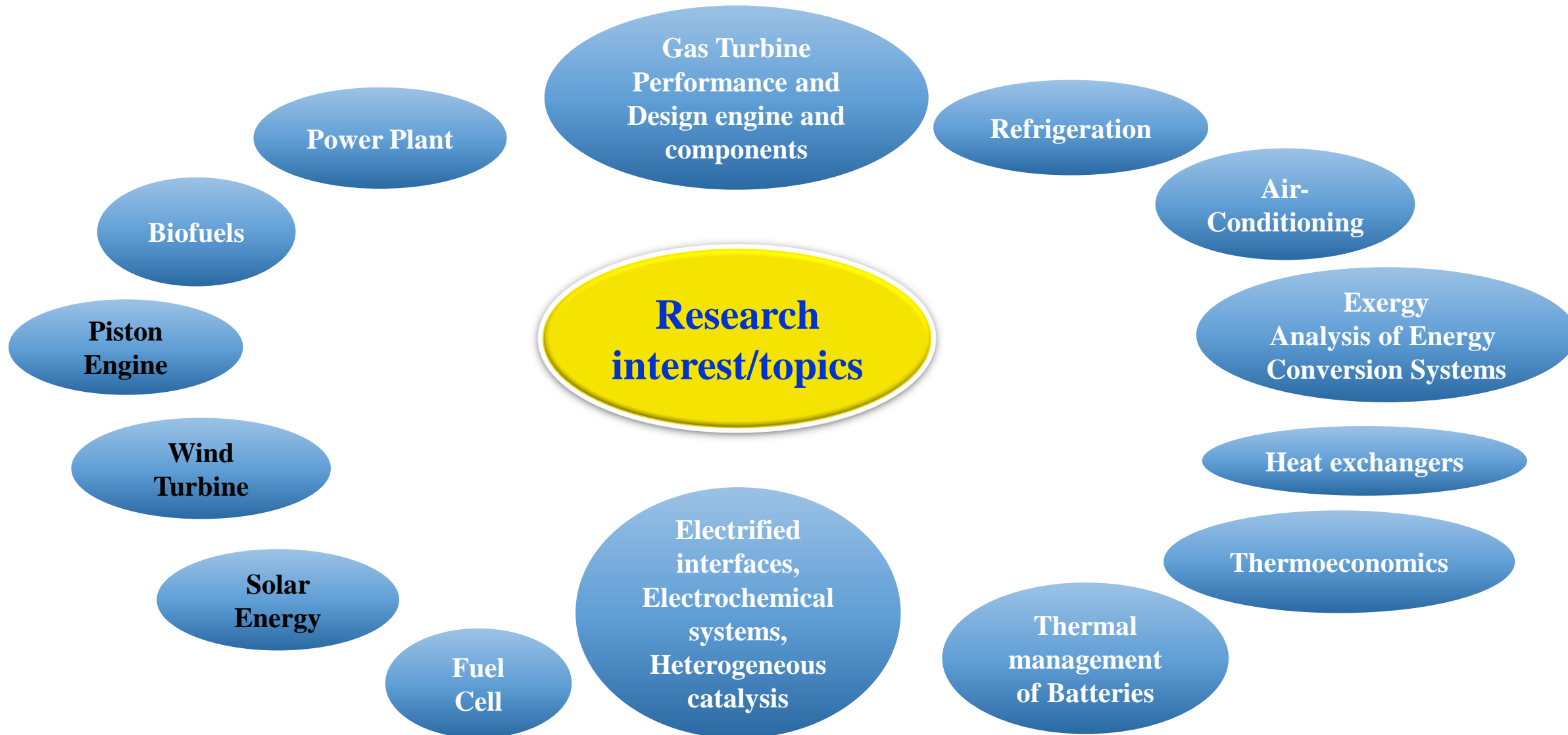
Prof. Dr. **Izabela** Batista Henriques
izabela@ita.br
Energy Department



Prof. Dr. **Cristiane** Aparecida Martins
cmartins@ita.br
Propulsion Department



Prof. Dr. **Ana** Maria Gómez-Marín
agomezma@ita.br
Chemistry Department



Collaborations and Projects

International Project (Universities, Industries, Government)

- Aerodynamic Influence of Airframe on Propeller and Engine Performance – INFLOPROP



Aerospace Industry

- Performance Determination of a small jet engine



ANEEL (Industry, Company, University)

- Development of a Computational Tool for Simulation of Electromechanical and Thermodynamic Transients for Integrated Evaluation of Stability in Combined Cycle Power Plants





Collaborations and Projects

ANP (BG Group and University)

- Downhole Disposable Casing Motor DDCM (Motor de Fundo Descartável para Perfuração com Revestimento) Modeling, Simulation and Virtual Prototype Testing



Academic (Universities)

- Advanced Civil Engine Integration



International Project (two Universities - CAPES/DAAD/GIZ)

- Biogas for Small Scale Power Generation



Collaborations and Projects

ANEEL (Industry and University)

- Industrial Gas Turbine Performance Health Monitoring



Industry and University

- Technological Innovation Project of Advanced Applications of Computational Fluid Mechanics for High Performance Aircraft



ANEEL (Industry and University)

- Competitiveness of Electric Power Generation in Brazil





Collaborations and Projects

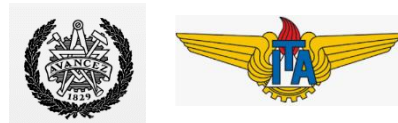
ANEEL (Industry and University)

- Carbon Dioxide Capture Technology (CO₂) and its Effects on Gas Turbine Performance



Educational Project

- Turbomachinery in Stationary Gas Turbines and Aero Engines



Professional Master's Degree in Gas Turbines

Start: march/2010

Duration: 2 years

Number of students: 26

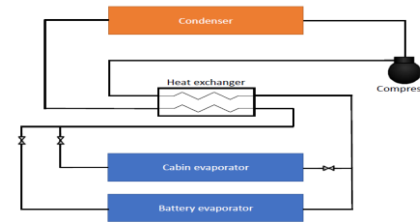
Company: VSE – Vale Soluções em Energia



Collaborations and Projects

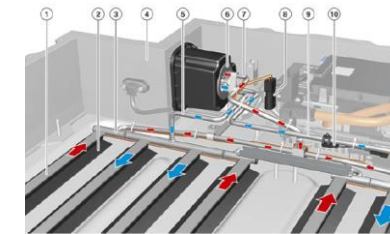
ANEEL (Industry and University)

- Modeling of battery/cabinet Cooling Schemes of EVs



ANEEL (Industry and University)

- Use of Novel Heat Exchangers and Nanofluids for Battery and Electronics Thermal Management

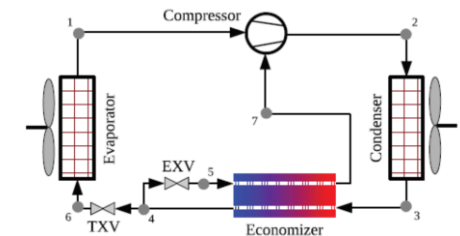


ANEEL (Industry and University)

- Evaluation of Low-GWP (Global Warming Potential) Refrigerant Fluids

University

- Novel AC Cycles for High-Outdoor Temperatures (two-stage cycle w/an economizer)



Industry and University (Thesis)

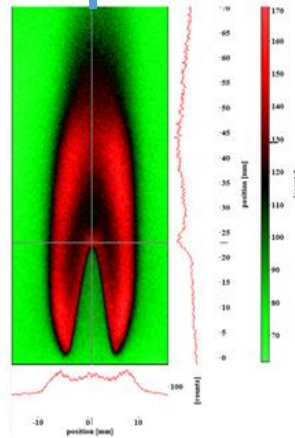
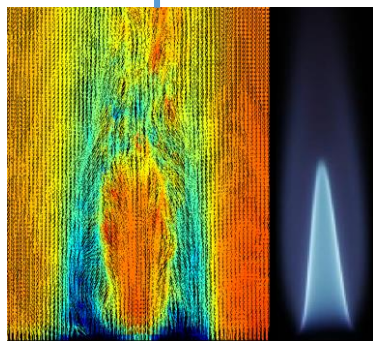
- Thermal Management of Batteries for eVTOLs (electric vertical take-off and landing vehicles)

Collaborations and Projects

Bio-QAV Ethanol
Biogas Syngas
Landfill Biogas



Biofuels
Fundamental Properties



Flammability Limits



Laminar Burning Velocity





Aeronautics Institute of Technology
Turbomachines Department

UNESCO UNITWIN Network

Innovative, Sustainable and Clean
Energy Research and Education

Contacts: cleverson@ita.br



United Nations
Educational, Scientific and
Cultural Organization

