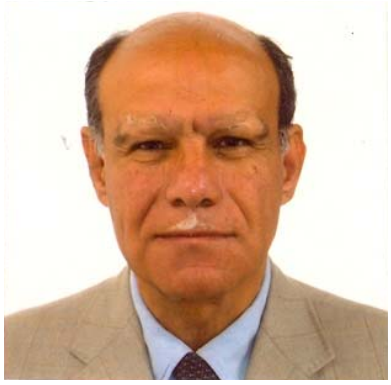
POLITECNICO DI TORINO



Giulio Romeo

- Born in Italy in 1949.
- Received his Degree of Doctor in Aeronautical Engineering from Politecnico di Torino (Turin Polytechnic University) in 1973.
- Takes up his research activity at the Politecnico di Torino (Turin Polytechnic University) since 1974 in the field of Design of Airplane Structures.
- He becomes Associate Professor of Design of Airplane Structures in 1980.
- He becomes Full Professor of Airplane Design and Aerospace Structures in 2001.

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ITALY

Teaching

- Progetto di Aeromobili(Aircraft Design) - (01CAMFQ - Laurea Magistrale in Ingegneria Aerospaziale)
- Tecnologie Aerospaziali (Aerospace Production Technology and Aerospace Materials) - (02FKWFQ - Laurea Magistrale in Ingegneria Aerospaziale)

Research interests

- ◊ Responsible and Scientific Coordinator of the national research project funded by the Italian Space Agency (ASI) (1994-2000) on "Design of High Altitude Solar powered Platform for Telecommunication and Earth Observation Applications".
- ◊ Responsible for the Platform Aeronautical Design of the first European Research project funded by the European Commission "HELINET: Network of the Stratospheric Platforms –UAV - for Traffic Monitoring, Environmental Surveillance and Broadband Services", FP5 in the IST action (Co-ordinator: Politecnico di Torino, 2000–03).
- ◊ Scientific Co-ordinator, of the EC Project ENFICA-FC (ENvironmentally Friendly Inter City Aircraft powered by Fuel Cells) (European Commission 6th FP, Aeronautics Action (2006-2009) with the main objective to develop and validate the use of a fuel cell based power system for propulsion of more/all electric aircraft. The first European two-seat electric-motor-driven airplane powered by fuel cells was developed and will be validate by flight-test (April 2010), by converting a high efficiency existing aircraft.
- ◊ Partner, of the European Network "UAVNET: Civilian UAV Thematic Network: Technologies, Applications, Certification", (EC - 5th FP in the Aeronautics Action, Oct 2001 – Nov. 2005) to advance the development of UAVs (Unmanned Air Vehicles) for civilian purposes. Coordinator: Israel Aircraft Industries
- ◊ Work Package Leader of 3 High Altitude Long Endurance Design in the European research CAPECON: "Civil UAV Applications & Economic Effectivity of Potential Configuration Solutions". EC - 5th FP - Aeronautics Action (2002-2005). Coordinator: Israel Aircraft Industries.
- ◊ Scientific Responsible of the EC project TANGO: Telecommunications Advanced Networks for Gmes Operation (EC-FP6-2005-Space1- Contract N. SIP5-CT-2006-030970 – 2006-2009, Coordinator : EADS Astrium) to support GMES projects and future operational GMES services as well as their associated end-users in the expression of telecommunications needs. TANGO will include Data Relay infrastructure for Earth Observations satellite to enable faster data scene acquisition and enhanced data distribution. Inclusion of **UAVs** in the global relay infrastructure enables quasi real time and continuous access to dedicated zones for monitoring or surveillance. A flight test with the scaled solar powered UAV was than prepared for final integration with on-going GMES developments in the framework of fisheries management. SESA can be used, in cooperation with Iridium satellite system, as a reconnaissance aircraft of the situation sending real time images and videos to the ground control station.
- ◊ Scientific Responsible of the research project: STRATOS: "Stratospheric Platform: A definition study for an ESA system".
- ◊ Scientific responsible of the CIRA project "PRORA-UAV. Utilizzo di configurazioni aeronautiche a superficie variabile per velivoli d'alta quota e senza pilota a propulsione solare" CIRA, Contratto di Ricerca N. 11/2004.

His research activity is concerning, the Design of Transport Aircraft, Design of UAV, and Design and Testing of Advanced Composite Aerospace Structures, mainly in the following fields:

a) A Feasibility Study is being carried out in the ENFICAFC project to provide a preliminary definition of new forms of commuter aircraft power and propulsion systems that can be obtained by fuel cell technologies (APU, Primary electrical generation supply, Emergency electrical power supply, Landing gear, De-icing system, etc); also Safety, certification & maintenance concepts shall be defined as well as a Life Cycle Cost evaluation.
In parallel, a two-seat electric-motor-driven airplane powered by fuel cells is being developed and validated by flight-test. The high efficiency two-seat existing aircraft Rapid 200, was selected over more than 100 light sport aircrafts and is being used for the conversion from internal combustion engine. The fuel cell system and the electric motor will be integrated on board and validate by flight-test. 40 kW power will be developed by the fuel cell unit (already designed, built and tested in laboratory ready to be installed on board) supported by a battery pack for the climbing flight phase.

b) Design of Very long Endurance High Altitude Solar Powered Unmanned Air Vehicles (UAV).

c) Manufacturing and experimental tests of an advanced composite UAV with 24 m wing span, 7m long.

d) Analytical, numerical and experimental investigation on advanced composite stiffened, un-stiffened and sandwich cylindrical airplane structures under biaxial compression and shear load.
   - Several theoretical (POBUCK software) and experimental analysis have been developed, with some original contribution, on the linear and nonlinear behaviour of anisotropic plate.
   - The minimum-mass optimisation software OPTICO was developed. The effects of cut-out in advanced composite panels under biaxial load and shear have also been evaluated.
   - A new and original testing machine was developed for simultaneously applying biaxial and shear load; a maximum longitudinal load of 520 kN, a transverse load of 200 kN and a shear load of 200 kN can be applied to panels with dimensions lower than 1000 by 700 mm. A very good correspondence was obtained between the analytical results, the many experimental tests results and the Finite Element analysis (code MSC/Patran/Nastran).

e) Analytical and experimental investigation of Wing boxes under pure bending or torsion, including non-linear effects of lateral pressure and incomplete diagonal stress field
f) Manufacturing of Advanced Composite wing box structures (1m, 6m, 21m,24m long) by graphite/epoxy pre-preg & autoclave curing. Analytical & experimental investigation.
g) Structural dynamic and aero-elastic analysis of conventional & unconventional wings.
h) Experimental and theoretical analysis of pin joint configuration.
i) Thermal/moisture expansion properties of advanced composite space structures. New, unique and original testing equipments have been developed for measuring the CTE and CME of high dimensional stability composite specimens and structures (HELIOS, SAX, SOHO/UVCS Satellites) having a quasi zero value of CTE. Tests are carried in a vacuum chamber (10^{-2} Pa); operating temperature range is limited to –30°C up to 90°C.

Responsible of several Grants with Aerospace Industries (SAX, SOHO, EFA, etc.). He has published about 135 technical papers and holds 1 trademark.

He presented several technical papers at National and International Symposium:
- AIAA/ATIO (Aviation Technology, Integration and Operations Conference)
- AIAA (American Institute of Aeronautics and Astronautics)
- AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference
- AIDAA (Italian Association of Aeronautics and Astronautics)
- AIRTEC (Int.Conf. “Supply on the wings”)
- Int. AVIATION CO2 Conf.,
- ECCM (European Conference on Composite Materials)
- ESA (European Space Agency)
- EWADE (European Workshop On Aircraft Design Education)
- IAF (International Astronautical Federation)
- ISRSE (International Symposium on Remote Sensing of Environment).
- HTE (Hi.Tech Expo)
- ICAF **(**International Committee on Aeronautical Fatigue**)**
- ICAS (International Congress of Aeronautical Science)
- ICCM (International Conference on Composite Materials)
- NASA
- OSTIV (Organisation Scientifique et Technique Internationale du Vol a Voile)
- SAMPE (Society for the Advancement of Material and Process Eng.)
- UAS 2010 (Unmanned Aircraft Systems)
- UAVNET
- UAV 2000. (International Technical Conference On “Uninhabited Aerial Vehicles”)
- UAV World

Bibliography (my papers)

Reviewer for:

- AIAA Journal of Aircraft
- Journal of Aerospace Engineering
- Composites, Part A

Links

Politecnico di Torino

- DIPARTIMENTO di INGEGNERIA AERONAUTICA e SPAZIALE
- POLITECNICO DI TORINO

European Commission funding projects:

- www.enfica-fc.polito.it
- www.uavnet.com
- http://www.teladnetgo.eu/

For more informations:

- **http://www.polito.it/grupporomeo/**