

Short CV

Francesco D'Auria had born 1954, received Master degree in Nuclear Engineering in 1978 and PHD degree in Nuclear Reactor Safety in 1980 both at University of Pisa. He was awarded of a research grant from University of Pisa in 1978. He was winner of the Assistant Professor position in 1981 at University of Pisa (area of nuclear thermal-hydraulics), of the Associate Professor position at University 'La Sapienza' in Rome in 1991 (area of radiation applications) and the Chair (Full) Professor position at University of Pisa in 2000 (area of nuclear thermal-hydraulics), the last one being the current position. He was engaged as 'Adjoin Professor' at University of Genova in the period 1993-2003 (area of world energy status and planning). He is ANS member since 1981. Since 1980 he has been member in several international working groups at ANS, EC, IAEA and OECD/NEA including CSNI since 2015 and CSNI Senior Group of experts since 2017. He was member and Chair of Technical Program in several International Conferences and member of the scientific committee for a dozen Journals. He is recipient of various recognitions, e.g. best paper, excellent session organizer, most downloaded paper notification, Marquis Who's Who VIP listee (selected for Albert Nelson Marquis Lifetime Achievement Award) etc. Key awards and achievements are:

- *Foreign Member of Argentinean Academy of Science in Buenos Aires (Argentina).*
- *"N.A. Dollezhal Gold Medal" by NIKIET in Moscow (Russia).*
- *Founder and Editor in Chief (during 5 years) of the Journal Science and Technology of Nuclear Installations (J STNI).*
- *Editor-in-Chief of Elsevier J NED since 2023; Editor since 2019; Editorial Board Member since 1990.*
- *Member of Editorial Board of a dozen Scientific Journals.*
- *Recipient of Technical Achievement Award (TAA) by American Nuclear Society in 2021.*
- *Enhancing and promoting the best use of computational tools in nuclear reactor safety and licensing: methods for validation, uncertainty, scaling and design of experiments, reliability of passive systems. Integrating fundamental technology and understanding with applications.*
- *General Chair of ANS NURETH-15 Conf., Pisa (Italy) 2013, ENS TopSafe Conf.s. Dubrovnik (Croatia) 2008, Helsinki (Finland) 2012, and Vienna (Austria) 2017, OECD/NEA/CSNI Spec. Meet., Madrid (Spain), 2022.*
- *Editor and key Author of the Elsevier Book "Thermal Hydraulics of Water Cooled Nuclear Reactors". Co-Editor and key Author of the 3 Volumes Elsevier "Handbook on Thermal Hydraulics of Water Cooled Nuclear Reactors"*
- *NURETH Fellow in Xi'an (PRC), 2017.*
- *Coordinator-promoter-author of four State of Art Reports (SOAR) published by OECD/NEA: Two-Phase Critical Flow (TPCF) in 1980, Thermal-hydraulics of Emergency Core Cooling Systems (TECC) in 1987, Boiling Water Reactor Stability (BWRS) in 1996, Scaling (S-SOAR) in 2017 and Reliability of Passive Systems (2020).*
- *Member of NEA scientific groups since 1980 (PWG-2, W-GAMA, etc.); CSNI member since 2016, until 2024; member of CSNI Senior Expert Group 2017-2020.*
- *Member of IAEA scientific and consultancy groups period 1983-2016.*
- *Life recognition for activities in BEPU area, (Lucca, BEPU2018).*
- *Co-author of 1200+ Papers (IRIS ARPI): 250+ Journal papers; 600+ Conferences; 100+ IAEA and OECD International Reports; 10+ Books.*

1. Curriculum vitae

Francesco D'Auria, born in Benevento (Italy) on Aug. 28th 1954, got the high school diploma in classic studies at the Lyceum 'P. Giannone' in Benevento in 1972.

He got the 'Laurea' in Nuclear Engineering (equivalent to Master) at University of Pisa on April 10th 1978. He discussed a thesis dealing with the thermo-mechanical design of the core of the Fast Breeder Reactor PEC. The thesis work was carried out in Bologna (CNEN Research Center) for a period of eight months.

He got the 'Post-Laurea' degree (Ph.D at the time) in Nuclear Reactor Safety at University of Pisa in 1980. He discussed a thesis dealing with the two-phase critical flow. The thesis was published by OECD/CSNI.

In 1978 he won a grant from the Italian Ministry of Education for an experimental research 'Blow-down Characterization and Jet Thrust Measurement'. The activity was performed at University of Pisa till 1981.

In 1981 he got the position of Assistant Professor ("Ricercatore Confermato") at University of Pisa.

In 1991 he got the position of Associate Professor (Chair Associate Professor, full professor 2nd level, "Professore Associato") at the University of Roma 'La Sapienza' in the area Nuclear Power Plants. Till the year 2000, his 'official' Chair has been 'Application of Radiation in the Technology' (see also below).

In 2000 he got the position of Full Professor (Chair Professor, or full professor 1st level, or "Professore Ordinario") at the University of Pisa in the area Nuclear Power Plants (discipline: Nuclear Reactor Thermal-hydraulics).

In the period 2002-2006 he served as Chairman of the Board of Professors ("Presidente del Consiglio di Corso di Laurea") in Nuclear Engineering at Faculty of Engineering of University of Pisa and in 2003 Chairman of the Joined Boards of Professors ("Presidente del Consiglio di Corso di Laurea *Aggregato*") in Nuclear Engineering and in Safety of Industrial and Nuclear Installations (this last 'Laurea Specialistica' recently institutionalized in Italy), both at University of Pisa.

2. Teaching Area

2.1 Institutional activity

In the period 1981-86, Francesco D'Auria hold classes mainly under the chairs 'Nuclear Power Plants' (Chair Prof. B. Guerrini) and 'Analysis of Nuclear Accidents' (Chair Prof. M. Mazzini). In the period 1986-91 he delivered lectures under the chair 'Thermal-hydraulics of Nuclear Power Plants' (Chair Prof. P. Vigni) and again classes under the Chair 'Nuclear Power Plants'.

He had the 'full responsibility' of the following four Courses at the Faculties of Engineering of Universities of Pisa, Roma "La Sapienza" and Genoa ('Adjoin Professor' and 'Full Professor' in the first case, 'Chair Associate Professor' in the second case, 'Adjoin Professor' in the third case and 'Full Professor' in the fourth case) during the years indicated below:

- 1. Thermal-hydraulics of Nuclear Power Plants at the University of Pisa (1991– present time);**
- 2. Applications of Radiation in the Technology at the University of Roma 'La Sapienza' (1992 – 2000);**
- 3. Energy and Nuclear Systems at the University of Genoa (1993 – 2004);**
- 4. Applied Thermodynamics at the University of Pisa (2001 – 2008).**

The Courses 1. to 3. have been or are delivered to students attending the fourth or the fifth year of the Master Degree ('Laurea') in Nuclear (Pisa and Roma) or Mechanical (Genoa) Engineering. The Course 4. is delivered to students attending the second year of the Bachelor Degree ('Laurea di Primo Livello') in Industrial and Nuclear Safety at University of Pisa.

He has been tutor of more than 50 Master ('Laurea') theses discussed at Universities of Roma, Pisa, Genoa, Bologna and Palermo. He has been tutor of more than 10 PhD students. Several of the above theses have been partly carried out abroad.

Key teaching subjects

Thermal-hydraulics of Nuclear Power Plants: Balance and constitutive equations for separated fluids. The multi-dimensional surface for convection heat transfer coefficient. Reflux condensation. Blow-down and critical flow. Natural

circulation scenarios in LWR. The thermal-hydraulic design of the core and of the primary loop of LWR. Thermal-hydraulics aspects of occurred events: TMI (1979), LaSalle (1988) and Chernobyl (1986). The BEPU approach.

Applications of Radiation in the Technology: Instrumentation of NPP. Application of radiation to the medicine (e.g. BNCT = Boron Neutron Capture Therapy), to food irradiation, to the characterization of nuclear fuel (irradiated or less), to the coal cycle (mining, cleaning, burning), to the environment protection, e.g. the suppression of SO₂ and NO_x by the EBDS = Electron Beam Dry Scrubber.

Energy and Nuclear Systems: Subdivision of countries in the world. The role of G-7/8, OECD and UN. Energy production and consumption in the world (statistics). The concept of 'Energy Intensity'. Environmental impact of energy production: consequences from nominal operation and accident conditions. Description of major accidents associated with energy production. The energy dilemma: low pro-capita energy consumption and pollutant production in highly populated countries, like China, and the high global environment impact (from energy production) from the same countries. Siting of energy installations. Scenarios for future developments.

Applied Thermodynamics: Fundamental concepts in Thermodynamics. First and second principle of thermodynamics. The balance equations: the Navier-Stokes equations. Fundamentals in heat transfer. The thermal cycles. The combustion process. Water properties. Laminar and Turbulent Flows. Fundamentals in the design of a Thermal system. The natural circulation.

2.2 Other Achievements

- Visiting Professor at
 - a) University of Lappeenranta (Finland), Summer School in 1989;
 - b) University of Nagoya (Japan) in 1993;
 - c) University of Ljubljana (Slovenia) in 1994, 1995, 1996, 1997, 1998, 1999 and 2001.
- Mentioned in 'WHO is WHO' in the Edition of November 2009.
- Elected Honorary Professor at Bangor University (Wales, UK) in 2019.
- Lecturer in a Course "Nuclear Reactor Safety" organized by University of Pisa and delivered to technicians of ENEA in **October 1984**.
- Scientific Coordinator and Lecturer in the Course "Thermal-hydraulic Phenomena in Nuclear Reactor Technology" organized by University of Pisa and Energoproekt in Sofia (Bulgaria), **June 29th – July 3rd 1987**.
- Scientific Coordinator and Lecturer in the Course/Workshop "International Seminar on the State of The Art on Safety Analyses and Licensing of NPP" organized by University of Pisa and Energoproekt in Varna (Bulgaria), **Nov. 2nd – 6th 1987**.
- Scientific Coordinator and Lecturer in two Courses/Workshop organized by IAEA "System Codes Validation and Uncertainty Analyses" held:
 - a) at VUJE, Trnava (Slovak Republic), **Oct. 20 – 31 1996**,
 - b) at CNEN, Rio-de-Janeiro (Brazil), **Nov. 3 – 14 1997**.
- Scientific Coordinator and Lecturer in the Course "Safety of NPP and Thermal-hydraulic Analyses" organized by ANPA/EU and delivered to technicians of the Romanian Nuclear Reactor Safety Authority, held in Pisa (Italy), **May 26th – June 6th 1998**.
- Scientific Coordinator and Lecturer in a Course organized by IAEA "Use of System Computer Codes for Accident Analysis" held at Univ. of Zagreb in Zagreb (Croatia), **Sept. 25th – Oct. 13th 2000**.
- Lecturer in the Short-Course "Relap5 Thermal-hydraulic System Code: Features, Validation and Suitable Use" held in the frame of CGEN-ENFIR-ENAM Conference in Rio de Janeiro (Brazil), **Oct. 16-20 2000**.
- Lecturer in a Course organized by IAEA "Safety Analysis Methodology and Utilization of Computer Code" held at KINS in Daejeon (Korea), **April 22 – May 3, 2002**.

- Lecturer in a Course organized by IAEA on “Computer codes for deterministic safety analysis (conservative and best estimate calculations)” held at CEZ in Brno (Czech Rep.), **June 10-14, 2002.**
- Lecturer in the Master Course in Nuclear Technology at UPC (Polytechnic University of Catalunya) in Barcelona (Spain), **June 20 – 21, 2012.**
- Lecturer in a Course organized by IAEA “Pressurized Water Reactors available for Near Term Deployment” held at KAERI in Daejeon (Korea), **September 3 – 7, 2012.**
- *Other IAEA Courses are mentioned under the item below ‘IAEA Expert or Consultant’.*
- Coordinator and Lecturer in a Course “Scaling, Uncertainty and Coupled 3D Neutron Kinetics / Thermal-Hydraulics” (3D SUNCOP) held at:
 - 1) Univ. of Pisa in San Piero a Grado, Pisa (Italy), **Jan. 05 – 09, 2004,**
 - 2) Pennsylvania University, University College (Pa, US), **May 23 – 27, 2004,**
 - 3) Univ. of Pisa in San Piero a Grado, Pisa (Italy), **June 14 – 19, 2004,**
 - 4) Univ. of Zagreb, Zagreb (Croatia), **June 20 – July 8, 2005,**
 - 5) Technical University of Catalonia (UPC) in Barcelona (Spain), **Jan. 23 – Feb. 10, 2006,**
 - 6) Autoridad Regulatoria Nuclear (ARN) in Buenos Aires (Argentina), **Oct. 2 – 13, 2006,**
 - 7) Texas A & M University at College Station (Tx, US), **Jan. 21 – Feb. 9, 2007,**
 - 8) AECL in Hamilton (Canada), **Oct. 7 – 19, 2007,**
 - 9) EC JRC in Petten (The Netherlands), **Oct. 13 – 31, 2008,**
 - 10) KTH in Stockholm (Sweden), **Oct. 12 – 30, 2009,**
 - 11) EC JRC in Petten (The Netherlands), **Oct. 18 – Nov. 5, 2010,**
 - 12) GE-Headquarter Wilmington (NC, US), **March 28 – Apr. 15, 2011,**
 - 13) KAERI in Daejeon (Korea), **April 16 – 27, 2012,**
 - 14) Univ. of Zagreb in Dubrovnik (Croatia), **Nov. 4 – 23, 2012,**
 - 15) Technical University of Catalonia (UPC) in Barcelona (Spain), **Oct. 7 – 25, 2013,**
 - 16) Texas A & M University at College Station (Tx, US), **March 31 – Apr. 4, 2014,**
 - 17) Imperial College in London (UK), **Sept. 15 – 27, 2014**
 - 18) Texas A & M University at College Station (Tx, US), **March 16 – 20, 2015 [SUNCOP-BF].**
- Coordinator and Lecturer at the Course “Fundamentals in Nuclear Technology” – five-weeks Course – prepared for the Technip Company, Rome (I), April – July 2010.
- Coordinator and Lecturer in the OECD/NEA/CSNI Seminar THICKET “On Transfer of Competence, Knowledge and Experience gained through CSNI Activities in the Field of Thermal-Hydraulics” held in:
 - Paris (F), **June 7 – 11, 2004;**
 - Pisa (I), **May 5 – 9, 2008;**
 - Paris, (F), **June 25-29, 2012;**
 - **Budapest (H), June 27 – July 1, 2016.**
- Coordinator and Lecturer in the Course “Natural Circulation In Water-Cooled Nuclear Power Plants” held in
 - Trieste (I), ICTP/IAEA framework, **June 27- July 2, 2004,**
 - Trieste (I), ICTP/IAEA framework, **June 25-29, 2007,**
 - Idaho Falls (ID, USA), INL/IAEA framework, **May 19-23, 2008,**
 - Trieste (I), ICTP/IAEA framework, **June 23-27, 2008,**
 - Pisa (I), IAEA framework, **June 22-26, 2009,**
 - Trieste (I), ICTP/IAEA framework, **May 17-21, 2010,**
 - Harbin (China), IAEA framework, **July 11-15, 2011,**
 - Corvallis (Oregon, US), OSU/IAEA framework, **July 23-27, 2012,**
 - Beijing (China), GRNSPG/CNNC framework, **Aug. 27-31, 2012,**
 - Trieste (I), ICTP/IAEA framework, **Dec. 3-7, 2012,**
 - Daejeon (Kr), KAERI/IAEA framework, **Sept. 30 – Oct. 4, 2013,**
 - Mumbai (In), GCNEP/IAEA framework, **Sept. 29 – Oct. 3, 2014.**
- Evaluator of PhD Theses discussed at:
 - a) University of Lappeenranta (Finland) in 1995 and 2009,
 - b) University of Ljubljana (Slovenia) in 1999,
 - c) Federal University of Rio de Janeiro (UFRJ, Brazil) in 2001 and 2002,
 - d) University of Barcelona (UPC, Spain) in 2004 and 2014,

- e) Chalmers University (Goteborg, Sweden) in 2005,
 - f) Grenoble University (France) in 2009,
 - g) Vienna University (Austria), in 2011.
 - h) Paris-Saclay (France), in 2023.
 - i) Marseille University in Cadarache, in 2023.
- Tutor of '**Laurea' (i.e. Master) theses** discussed in Italy at the Universities of:
 - a) Pisa (more than 60),
 - b) Roma "La Sapienza" (6),
 - c) Genoa (8),
 - d) Bologna (1),
 - e) Palermo (1).
- Tutor of more than 30 **Ph.D theses** at University of Pisa.
- Organizer of four 'Technical Visits' abroad involving students from the Universities of Roma, Pisa and Genoa:
 - a) France, 1994: CEA Grenoble, CEA Cadarache, NPP FBR Superphenix, CEA/IPSN Fontenay-aux-Roses, NPP Chooz;
 - b) Germany-Sweden, 1996: Siemens Erlangen, Siemens Mannheim (UPTF simulator), ABB Nuclear Fuel Factory in Vasteras, NPP PWR and BWR Ringhals;
 - c) USA-Canada, 1998: University of Pennsylvania, TMI-1 and TMI-2 PWR units, Darlington CANDU Units, laboratories of AECL Chalk River;
 - d) Eastern Europe and Austria, 2002: Krsko PWR NPP (Slovenia), Bohunice VVER-440 NPP (Slovakia), Ignalina RBMK NP (Lithuania), Chernobyl RBMK dismissed NPP, Rovno VVER 440 and 1000 NPP and Kiev INSC (Ukraine), IAEA in Vienna (Austria).
- Organizer of 'Student Sessions' for three ICONE Conferences (ICONE-6, 7 and 8). In ICONE-6, and -8 he got an 'ASME Award' in recognition of his activity.
- Member of Committees for the 'Student best Paper Selection' in Conferences held in Slovenia, Croatia and Serbia (1995 – 2009).
- Main Tutor of theses performed abroad by students of Universities of Pisa, Genoa and Roma:
 - RPI of Troy (NY, USA), in 1985 and 1987;
 - CENG, Grenoble (F), in 1988, 1992, 1993, 1995, 1997, 1998, 2003 and 2006;
 - Halden Project (N), in 1992;
 - Lappeenranta University (SF), in 1992 and 1997 (3 Theses);
 - CEA in Fontenay-aux-Roses (F), in 1992/93;
 - PSI in Villingen (CH), in 1993, 1996, 1998 and 2000;
 - CEA in Cadarache (F), in 1995;
 - Siemens in Erlangen (G), in 1997;
 - Purdue University (USA), in 1997;
 - Delft University (NE), in 1998 (2 Theses);
 - Urbana University (USA) in 1999;
 - Texas A&M University at College Station (USA) in 2000, 2007, 2012, 2013, 2016, 2019 and 2023;
 - Penn State University (PSU) at College Park (USA) in 2001 (2 Theses), 2002 and 2003;
 - GRS (Garching, Germany) in 2004;
 - FZJ (Julich, Germany) in 2005;
 - General Electric (USA) in 2009;
 - McMaster University (Canada) in 2009.
- Tutor of foreign student theses (partly) performed at University of Pisa. Theses discussed at:
 - University of Munchen (G) in 1993, 1994 and 1995 ('short thesis');
 - University of Lappeenranta (SF) in 1995 and 1999 ('thesis');
 - Federal University of Rio de Janeiro (BRA) in 2001 and 2002 ('PhD thesis');
 - El-Sharif University of Teheran (Iran) in 2002 and 2003;
 - University of Barcelona (Spain) in 2005 and 2006;
 - University of Vienna (Austria) in 2011;
 - University of Accra (Ghana) in 2014 and 2016;
 - Xi'an University (China), PHD, in 2021, 2022 and 2023 (two students).

3. Scientific activity

In the period 1977-78, for about eight months, he has been involved with the analysis of creep and differential swelling in the structural materials of the core of a FBR.

Starting from 1978, the research activity has been addressed toward the safety and the design of LWR. Four broad areas can be distinguished, as testified by the publication list:

- Fundamental thermal-hydraulics;
- System thermal-hydraulics;
- Validation of complex codes and uncertainty evaluation;
- Application of the thermal-hydraulics to the design and the safety evaluation of LWR.

He set-up the GRNSPG (Gruppo di Ricerca Nucleare in San Piero a Grado) in 2003 www.grnspg.ing.unipi.it.

Main activities are in the following areas: A) characterization of thermal-hydraulic phenomena relevant to NPP safety and design. B) characterization of complex experimental scenarios in NPP simulators. c) identification and use of consistent sets of scaling criteria for designing experimental facilities (PWR, BWR and VVER type reactors). d) design, construction and management of the Piper-one BWR simulator. e) identification and use of consistent set of criteria for system codes validation. f) proposal of the UMAE uncertainty methodology and, recently, of a method for ‘internal assessment of uncertainty’, called CIAU. G) evaluation of safety and design optimization of NPP existing or under design (including those equipped with passive systems). h) licensing analyses based on the application of best-estimate code and uncertainty evaluation. i) characterization of the “boron issue” (de-boration, boron dilution and dilution rate) in PWR. j) leading the group for issuing the FSAR Chapter 15 of Atucha-II NPP with BEPU format. k) leading the group for the design of NUTEMA. L) Depicting the role of E. Fermi as nuclear Engineer. M) Role of very low probability events in Licensing. N) Role of LBLOCA in design and licensing of LWR. O) Characterization of Phenomena in nuclear thermal hydraulics including prioritization of research in the area.

Summary list of key-acronyms is (see also specific items in this CV):

- **ANS:** Member - since 1980 till current year.
- **BEMUSE:** (Planning and Contribution to) OECD/NEACSNI Best Estimate Methods Study – period 2000-2010.
- **BEPU** (Contribution to setting up) the Best Estimate Plus Uncertainty Method for use in the FSAR Chapter 15 (actually used for the licensing of Atucha-2) – since around 2000 till current year.
- **BIP** (Boiling Instability Project): not activated Project based on PIPER-ONE facility following the Chernobyl event – period 1985 - 1990.
- **BLOWAES:** model/procedure (hardware instrumentation and software) to measure TPCF – period 1978-1983.
- **BOOK:** see Elsevier.
- **CCVM:** see SETF.
- **CIAU:** (Development and Application of) Code with the capability of Internal Assessment of Uncertainty to predict uncertainty in system code calculations – period 1996-2005
- **CONUSAF:** (Main proponent and Contributor to) the Consortium of users in nuclear thermal-hydraulics established at Texas A&M University – since 2018 till current year.
- **CRISSUE:** (Leader of the) EC funded project denominated CRISSUE dealing with coupled code (Thermal-hydraulics and 3D Neutron Kinetics). Also member of other EC funded projects like EUROFASTNET, NURESIM, NURISP, NURES SAFE – period 2000-2015.
- **CSNI:** Member or Chair of Several Working Groups (see also below) – since 1980 till current year.
- **CT:** Counterpart Test. Planning, performing analyzing CT in PWR and BWR conditions (various ITF) – period 1980-2014.
- **ELSEVIER:** Editor of a Book (> 1200 pages) on NUCLEAR THERMAL-HYDRAULICS – period 2013-2017.
- **FTBM:** (Development and Application of) Fast Fourier Transform Based Method for the quantification of accuracy of system code calculation (also embedded into the US NRC ACAP) – period 1989-1995.
- **FONESYS:** (Main proponent and Contributor to) the Forum and Network of Code Developers in Thermal-hydraulics – since 2009 till current year.
- **GRNSPG:** Founder of the Nuclear Research Group in San Piero a Grado (www.grnspg.ing.unipi.it) – period 2003 till 2017

- **IAEA (UN Agency):** Consultant for several activities and Member or Chair of Several Working Groups (see below) – since 1985 till current year.
- **ITF:** see SETF.
- **JOURNAL:** Member of Scientific Committee of a dozen International Journals (e.g. see NED and STNI)– since 1990 till current year.
- **NC** (Founder, Organizer and Teacher at) Natural Circulation Course in the framework of cooperation between IAEA and local host (see specific list), held 13 times till now – period 2004-2014.
- **NEA (OECD agency):** see CSNI
- **NED:** (Member of Editorial Board of the) J. Nuclear Engineering and Design – period 1990 till current years. Associate Editor since 2019.
- **NUTEMA:** (Main proponent of) Nuclear Technology Master for Knowledge Transfer & ‘The NPP in one Room’ installed at the GRNSPG headquarters in San Piero a Grado (Pisa) – period 2012-2017.
- **NURETH:** (Series of Conferences of American Nuclear Society, ANS). General Chair of NURETH-15 held in Pisa in 2013 – period 1983 till current year.
- **OECD:** see CSNI
- **PIPER:** (Operation of) *Separate Effect* Facility for the experimental investigation of the blow-down phenomenon in two phase flows including measurements of TPCF, Jet thrust and loads on internals – period 1978 -1985.
- **PIPER-ONE:** (Design, Construction and Operation of) *Integral Effect* Facility for the experimental simulation of SBLOCA in BWR – period 1980-1995.
- **PREMIUM** (Project/activity of OECD/NEA/CSNI dealing with the characterization of the parameters at the origin of uncertainty, on-going since 2013). Co-Founder of the Project and Participant – period 2013-2016.
- **REPAS** (Development and Application of) method to evaluate the reliability of passive systems (lately embedded into the EC procedure RMPS) – period 1999-2005.
- **RNC:** promoter of Reverse Natural Circulation (RNC) benchmark in PKL facility to further demonstrate the importance of detailed knowledge of pressure drops in applications of nuclear thermal-hydraulics.
- **SILENCE** (Main proponent and contributor to) the network of experimentalists involved with large projects in nuclear thermal-hydraulics – since 2012 till current year.
- **SSG** (OECD/NEA/CSNI – WGAMA Special Scaling Group) Coordinator of the Group starting from 2013, based on the contribution to closing the scaling issue in Nuclear Reactor Thermal-hydraulics, J. NED paper; report approved by CSNI in June 2016 – period 2013-2017.
- **SSG-2** (Contribution to) IAEA Standard Safety Guidance for Safety Analyses – period 2007-2010 .
- **SRS 23 and 52** (Contribution to) IAEA Safety Report Series No 23 for Accident Analysis in Light Water Reactor and (Contribution to) IAEA Safety Report Series No 52 for Uncertainty Methods Features and Applications. Contribution to other SRS reports – period 1997-2008.
- **SETF & ITF CCVM:** (Contribution to) OECD/NEA/CSNI Separate Effect Test Facility and Integral Test Facility Computer Code Validation Matrices – period 1982-1996.
- **SM-TH:** Specialists Meeting in Thermal Hydraulics (years 2019-2022)- Chair of the Conference in Madrid 2021 aimed at streamlining the current status in the area and at proposing roadmap for research.
- **SOAR on BWRS:** Lead Author and Editor of OECD/NEA/CSNI SOAR on Boiling Water Reactor Stability – period – period 1990-1995.
- **SOAR on TECC:** (Contributions to) OECD/NEA/CSNI SOAR on Thermal-hydraulics of Emergency Core Cooling – period 1983-1989.
- **SOAR on TPCF:** State of the Art on Two-Phase Critical Flow issued by OECD/NEA/CSNI – period 1978-1981.
- **SOAR on Scaling (S-SOAR):** see also SSG – period 2013-2017.
- **SOAR on Passive Systems:** (2016-2021). Lead Author and Editor of the Report of the reliability of Passive System approved in 2020 and under publication in 2021 at OECD/NEA/CSNI).
- **STNI:** (Founder, Editor-in-Chief and Member of the Editorial Board of the) J. Science and Technology of Nuclear Installations, currently (honorary) Founder of the Journal – period 2006-2012.
- **SUNCOP** (Founder, Organizer and Teacher at) Seminar on Scaling, Uncertainty and 3D Coupled code Calculation in Nuclear Technology, held 17 – period 2004-2015.
- **SWINTH:** (series of) Conferences dealing with instrumentation design and use in nuclear thermal-hydraulics (see also SILENCE) – period 2015 till current year.
- **TACIS R2.03/97**, EC contract 30303: (Leader of the) EC funded project dealing with Accident Management in VVER-1000 and with the safety of RBMK. Also contributor in other TACIS Projects – period 2000-2006.
- **TECDOC** (Contribution to various) IAEA reports (e.g. Natural Circulation, Passive systems, NPP power upgrade etc.) – period 1990-2010.
- **THICKET** (Founder, Organizer and Teacher at) Seminar for transferring the Knowledge and the Expertise in the area of System Thermal-hydraulics acquired by OECD/NEA/CSNI –period 2003 till current year.
- **UAM** (Project/activity of OECD/NEA/NSC dealing with the estimation of Uncertainty in coupled code calculations, on-going since 2007). Co-Founder of the Project - (activities in the) period 2006-2012.

- **UMAE:** (Development and Application of) Uncertainty Method based on Accuracy Extrapolation to predict uncertainty in system code calculations – period 1980-1995.
- **UMS:** (Planning and Contributions to) OECD/NEA/CSNI Uncertainty Method Study – period 1993-1999.

3.1 Other Achievements

- Member (Foreign) of the National Academy of Science in Buenos Aires since 2012 (invited speech listed below, Diploma received in 2013 and in 2018).
- Award “N.A. Dollezhal gold medal” received in Moscow on March 3rd 2006 from NIKIET General Director B. Gabaraev and Gen. V. Romashin in recognition of technical achievements and management of the TACIS Project R2.03/97 on RBMK.
- Editor and Main Author of the Elsevier Book Thermal-hydraulics in Water Cooled Nuclear Reactors (16 chapters written by leading scientists in the sector) – published 2017.
- Co-Editor and Main Author of the 3 Volumes Elsevier Handbook on Thermal-hydraulics in Water Cooled Nuclear Reactors (16 chapters written by leading scientists in the sector) – published 2023.
- Member of ‘American Nuclear Society’ (ANS) since 1981:
 - Award received in 2006 for 25 years of continued membership.
 - Elected for the Executive Committee of the TH Division in 2012.
- Recipient of the Technical Achievement Award (TAA) from American Nuclear Society (THD), in 2021 with the motivation “*For his exceptional contributions to the understanding of fundamental thermal-hydraulics phenomena in light water reactors and his pioneering contributions to the development of best estimate approaches that account for uncertainty*”.
- Member of American Society of Mechanical Engineering (ASME) since 2013;
- Founder and Editor-in-Chief of the J. Science & Technology of Nuclear Installations (Hindawi Publisher) established at the end of 2006 (first issue in 2007) till 2011; ISI recognition received June 2012.
- Member of ‘Advisory Editorial Board’ of the J. Nuclear Engineering and Design (North-Holland Publisher) since 1990 and Associate Editor since 2019; Editor-in-Chief since 2023.
- NURETH Fellow award received during NURETH-17 Conference in Xi’an (PRC), Sept. 3-9, 2017.
- Award for lecturing at the 43rd International Nathigali Summer College on Physics and Contemporary Needs, Islamabad (Pakistan), July 16 - 21, 2018.
- Member of the Editorial Board of “Izvesiya VUZov. Yadernaya energetika” (“News of Higher Educational Institutions. Nuclear Power”), since 2014.
- Member of the Technical Review Committee of the JANSI (Japan Nuclear Safety Institute), established Nov. 15 2012 as follow-up of the Fukushima accident (“to never repeat the accident”).
- Member of the ‘Scientific Committee’ of the J. Energia Nucleare (ENEA) since 1995, till the end of the publication (1998).
- Member of the ‘Editorial Board’ of J. Nuklearna Tehnologija, now J. of Nuclear Technology & Radiation Protection, (Yugoslav Nuclear Society) since 1998.
- Member of the ‘Editorial Board’ of J. Thermal Energy, Russian Journal – <https://journal.iate.obninsk.ru/> - since 2013.
- Honorable Editorial Board Member of Journal Research & Development in Material Science (RDMS) – Crimson Publisher, since 2017.

- Founder in 2003 and managing Director of GRNSPG (Gruppo di Ricerca Nucleare San Piero a Grado, www.grnspg.ing.unipi.it).
- Chairman of the ANS NURETH-15 (breakdown NURETH series of) Conference, held in Pisa on May 12-16, 2013.
- Author and Editor of an Elsevier Book on Nuclear Thermal-hydraulics (16 chapters, one dozen of authors, ranging from fundamentals to applications in NPP). Activity performed in 2015 and 2016.
- Technical Program Chairman of the ENS Conference “TopSafe”, held in Dubrovnik (Croatia) in October 2008, in Helsinki (Finland) in April 2012 and in Vienna (A) in February 2017..
- Founder and promoter of the FONESYS (Forum connecting the developers of the key system thermal-hydraulic computer codes): meetings held in Pisa (I), 2010, Grenoble (F), 2011, Daejeon (Kr), 2012, Helsinki (SF), 2013, etc..
- Founder and promoter of the SILENCE (L&H WR [Light and Heavy Water [Nuclear] Reactor) thermal-hydraulic Experiments Network for the Consistent Exploitation of the data): meetings had in Pisa (I), 2012, Helsinki (SF), 2013, etc.. The SWINTH Conference series (first one held in Livorno on June 15-17, 2016) originated from this initiative.
- VEBLEO Fellow since May 2021.
- Member (starting July 2021 and till December 2022) of Asian Council of Science Editors (ACSE).
- Expert of the Italian Embassy in Argentina, participating to the Workshop “La energía, factor de independencia económica”, UADE Buenos Aires, 18-19 March 2009, delivering lectures and signing the ‘Buenos Aires Carta for Energy.
- Expert for KAERI in Daejeon (South Korea) in relation to the development and the qualification of a new system thermal-hydraulic code, November 2010.
- Member of the ‘International Reviewers Group’ of the J. of Mechanical Engineering (‘Strojniski Vestnik’, Faculties of Mechanical Engineering of Universities of Ljubljana and Maribor, Association of Mechanical Engineers and Technicians of Slovenia, Association of Metal Industry of Slovenia) since 2002.
- Member of UIT (Unione Italiana Termofluidodinamica) since 1984.
- Member and Italian representative in several international Working Groups:
 - OECD-CSNI (Organization for Economic Cooperation and Development – Committee on the Safety of Nuclear Installations) in various Task Groups and in PWG-2, since 1979 (related to TPCF activity), during the period 1983-2000. Starting from 2000 he is Italian representative in W-GAMA, Starting from 2011 (year of formation) member of the W-GAMA ‘bureau’ to orient the Group activities. Starting from 2015 he is also CSNI member. Starting from 2017 he is member of the CSNI Senior Group of Experts;
 - OECD-NSC (OECD – Nuclear Science Committee) starting from 1995;
 - CEC and EC (Commission of European Communities) since 1982,
 - IAEA (International Atomic Energy Agency) since 1985 (see also below for details).
- Member of the ‘International Electro-technical Commission’ (IEC) – nuclear instrumentation – since 1996.
- One of the J. Papers where he is main author (published 2012) considered in the edition of “Advances in Engineering Series”. Advances in Engineering service alerts the scientific community to breaking journal articles considered to be of importance to the progress in Engineering technologies
- He got the invitation from the Argentinean Academy of Science to discuss the topic ‘Nuclear Technology and Sustainable Development’ in Buenos Aires on October 2001 (also listed below).
- Selected in 2018 to receive the Albert Nelson Marquis Lifetime Achievement Award by Marquis Who’s Who (already a VIP listee).

- He held different invited seminars (main subjects: ‘thermal-hydraulic scaling’, ‘code assessment and uncertainty prediction’, ‘application of uncertainty to licensing’, ‘nuclear energy and sustainable development’, ‘the boron issue in PWR-NPP’, ‘the safety of RBMK’, ‘the Nuclear Reactor Safety’ and ‘the BEPU approach’). List of hosting Institutions given below:
 - General Electric (GE), San Jose (Ca, USA) in 1984;
 - University of Sofia, Sofia (Bulgaria), in 1989;
 - CENG, Grenoble (France) in 1990;
 - University of Zagreb, Zagreb (Yugoslavia) in 1990;
 - NPO Energya of Moscow (USSR) in 1991;
 - Academy of Science in Novosibirsk (USSR), in 1991;
 - Atomic Energy Council of Taipei (Taiwan) in 1991;
 - Centro Atomico Bariloche (CAB) - Bariloche (Arg) in 1992;
 - Atomic Research Institute in Chengdu (PRC) in 1992;
 - J. Stefan Institut (IJS) - Ljubljana (Slovenia) in 1994;
 - Jao-Tong University in Xi'An (China) in 1994;
 - Energoproekt, Sofia (Bulgaria) in 1995;
 - CNEN - Rio de Janeiro (Brazil) in 1995;
 - University of Recife (Brazil) in 1995;
 - Tsinghua University of Beijing (PRC) in 1996;
 - Beijing Institute of Nuclear Engineering (BINE) - Beijing (China) in 1996;
 - Commissariat a L'Energie Atomique (CEA) - Cadarache (France) in 1996;
 - Nuclear Research Institute (NRI) - Rez (Czech Republik) in 1996;
 - Atomic Energy Control Board (AECB) - Ottawa (Canada) in 1996;
 - Centro Tecnologico da Marinha en Sao Paulo (CTMSP) – Sao Paulo (Brazil) in 1997;
 - Commision Nacional de Energia Atomica (CNEA) – Buenos Aires (Argentina) in 1998;
 - Autoridad Regulatoria Nuclear (ARN) – Bariloche (Argentina) in 1999;
 - University of Urbana – Urbana (Ill, USA) in 1999;
 - University of Rio de Janeiro (COPPE) – Rio de Janeiro (Brazil) in 1999;
 - Atomic Energy Organization of Iran (AEOI) – Tehran (Iran) in 2000;
 - Academy of Science on the Role of Nuclear Energy – Buenos Aires (Argentina) in 2001;
 - Nuclear Power Plant Kozloduy – Kozloduy (Bulgaria) in 2001;
 - Korean Atomic Energy Research Institute (KAERI) – Daejeon (South Korea) in 2002;
 - University of Pisa (Faculty of Political Science) – Pisa (Italy) in 2002;
 - INAC (International Nuclear Atlantic Conference) Plenary Session – Rio de Janeiro (Brazil) in 2002;
 - BHABHA Atomic Research Center in Mumbai (India) in 2003;
 - Forschungszentrum Karlsruhe (Germany) in 2003;
 - Nuclear Power Plant Metzamor – Metzamor (Armenia) in 2003;
 - Autoridad Regulatoria Nuclear (ARN) – Buenos Aires (Argentina) in 2004;
 - EC Joint Research Center (JRC) in Petten (Netherlands) in 2004;
 - AREVA (Framatome-ANP / Siemens-KWU) in Erlangen (Germany) in 2004;
 - CNEN in Rio de Janeiro (Brazil) in 2005;
 - Vattenfall in Stockholm (Sweden) in 2005;
 - NIKIET in Moscow (Russia) in 2006;
 - Jao-Tong University in Shanghai (China) in 2006;
 - VATESI (Nuclear Regulatory Authority) in Vilnius (Lithuania) in 2006;
 - COMENA and Presidency of Algerian Republic in Alger (Algeria) in 2007;
 - ETN in Rio de Janeiro (Brazil) in 2007;
 - BULATOM in Varna (Bulgaria) in 2007;
 - AERB in Mumbai (India) in 2008;
 - NPIC in Chengdu (China) in 2008;
 - INL in Idaho Falls (ID, US) in 2008;
 - Yarmouk University in Irbid (Jordan) in 2008;
 - UADE (University) in Buenos Aires in 2009 (see also main bullet above);
 - General Electric – Hitachi (GEH), Wilmington (NC, USA) in 2010;
 - KAERI – Daejeon (South Korea) in 2010;
 - ININ – Mexico City (Mexico) in 2011;
 - Rolls-Royce, Civil Nuclear Engineering Dept. – Derby (UK) in 2011;
 - CGNPC-CNPRI, Nuclear Research Company – ShenZhen (China) in 2012 [cancelled –weather conditions];
 - CTMSP – Sao Paulo (Brazil) in 2012;
 - Academy of Science on the History of Nuclear Thermal-Hydraulics – Buenos Aires (Argentina) in 2013;
 - JANSI – Tokyo (Japan), in 2013;

- IAEA-Webinar (devoted to ‘Nuclear Embarking Countries in South-East Asia) – from Pisa (Italy), in 2013 & 2014 [also item ppp of list of IAEA activities];
 - AMAZUL – Sao Paulo (Brazil) in 2014;
 - ETN – Rio de Janeiro (Brazil) in 2014;
 - Academy of Science – Buenos Aires (Argentina) in 2014;
 - NPIC-RETH in Chengdu (China) in 2015;
 - KAERI in Gyeongju (South Korea) in 2016;
 - NURETH Conf. Organization, Panel Session on Passive Systems, Xi’an, Sept. 2017;
 - Academy of Science on a new barrier to the release of fission product – Buenos Aires (Argentina), March 2018;
 - Int.l Nathigali Summer College, Islamabad (Pakistan), July 2018;
 - MePhi Int.l Summer School on Engineering Computing in Nuclear Technology, Moscow (Ru), June 2020;
 - VEBLEO Webinar, May 2021;
 - University of Ancona, Plenary Lecture at the 6th AIGE/IIETA, Ancona (I), July 2021;
 - Academy of Science on Perspectives of Nuclear Reactor Safety, Buenos Aires (Argentina), March 2023;
 - ENEA center of Brasimone, Bologna (I), October 2023.
- Brazilian Government Expert in 1997-2003, and starting from 2011 in relation to the design of an innovative nuclear reactor for naval propulsion.
 - TACIS Project Director in 2003-2006 for the EC Project “Software Development for Accident Analysis of VVER and RBMK Reactors”. Involved Russian partners are NIKIET/Minatom, Kurchatov, Hidropress, EREC, Rosenergoatom and Gosatomnadzor. The design of AM procedure in VVER-1000 and the set-up of a comprehensive chain of codes for accident analysis in RBMK constituted the subject of the 4 MEURO Project funded by EC.
 - TWINNING Project Director in the period 2004-2008: Two EC projects in Bulgaria and in Hungary concerned with Nuclear Reactor Safety and Energy Efficiency, respectively.
 - NA-SA (Nuclear Utility in Argentina) Contract Responsible and Key-Expert in 2006-2013 for the construction of Atucha-2 NPP (around 800 Mwe PHWR). Analyses in the areas of thermal-hydraulics, CFD, structural mechanics, neutron kinetics, nuclear fuel, radiation protection have been performed and the FSAR Chapter 15 has been issued (“rev. 0” in Sept. 2009, “rev. 3” in November 2010 provided to Regulatory Authority) adopting the innovative BEPU (Best Estimate Plus Uncertainty) approach for the analysis of all (around 83) transient scenarios. Atucha-2 started to produce electrical energy in 2014.
 - CNEN (Regulatory Authority in Brazil) Expert in 1999-2002 in relation to the licensing process connected with the Large Break LOCA of Angra 2 (four loops PWR), including performing an independent Best-Estimate analysis with uncertainty evaluation.
 - CNEN (Regulatory Authority in Brazil) Expert in 2001-2004 in relation to the licensing process connected with the ATWS of Angra 2 (four loops PWR), including performing independent Best-Estimate analyses.
 - ARN (Regulatory Authority in Argentina) Expert in 2000 in relation to technical issues concerned with the safety of existing NPP in Argentina (Pressurized Heavy Water Reactors).
 - KNPP (Kozloduy NPP, Utility in Bulgaria) Consultant in 2001 and 2004 in relation to the Large Break LOCA of the Kozloduy Units 3 & 4, VVER 440/230: execution of independent evaluation with Relap5 and Cathare codes including uncertainty evaluation. The activity in 2004 also included the application of uncertainty methods and the evaluation of radioactive releases following LBLOCA.
 - IRR (Austrian Government) Consultant in 2002 and 2003 in relation to the (multiple) Main Steam Line Break of the Temelin Units 1 & 2, VVER-1000: execution of independent safety analyses and technical support.
 - VUJE (Slovak Republic) Consultant in 2004 in relation to Accident Analyses of Bohunice and Mochovce VVER 440 Units.
 - KFKI (Hungary) Consultant in 2005 and in 2009 to review the Final Report of the operation of the PMK integral test facility, simulator of VVER-440.
 - Rolls-Royce (UK) Consultant in relation to the VVER technology, in 2012, and in relation to BWR technology, in 2013.

- OECD/CSNI Expert in 1992 for evaluating experimental facilities in Russia and Ukraine and recommending financing.
- IAEA Principal Scientific Investigator in 1995-1998, in two Working Groups (CRP = Coordinated Research Program) “*Validation of CHF, post-CHF and pressure drop correlations in two-phase flows*” and “*Comparative evaluation of system codes capabilities in the areas of Primary Circuit, Containment and Severe Accidents*”. Chairman in the second Group.
- IAEA Principal Scientific Investigator in 2003-2006, in two Working Groups (CRP = Coordinated Research Program) “*Safety Significance of Postulated Initiating Events for different Research Reactors and Assessment of Analytical Tools*” and “*Assessment of the Interfaces between Neutronic, Thermal-hydraulic, Structural and Radiological Aspects in Accident Analysis*”. Chairman in both Groups. The second group finalized to the study of complex transient scenarios (PRISE) in VVER-440.
- IAEA Principal Scientific Investigator in 2004-2007, in the Working Group (CRP = Coordinated Research Program) “*Natural Circulation and Reliability of Natural Circulation Systems*”.
- IAEA Principal Scientific Investigator in 2006-2009, in the Working Group (CRP = Coordinated Research Program) “*Evaluation of Uncertainties in Best Estimate Accident Analysis*”. Chairman of the Group.
- ICTP ‘Guest Scientist’ for one week in Trieste on June-July 2004, June 2007, June 2008 and December 2012 (see also section 2.2).
- OECD/NEA-CSNI SETH, PKL and PSB Project Representative in 2000-2006. Projects dealing with the CFD application (SETH) the boron dilution issue in PWR (SETH and PKL) and the safety of VVER-1000 (PSB).
- IAEA Expert or Consultant [1-4 weeks mission, except item ppp)] in relation to:
 - a) “Assessment of Accident Management Procedures in case of Station Blackout in the Krsko NPP (PWR Westinghouse)”, University of Zagreb, Zagreb (Yugoslavia), in 1991.
 - b) “Assessment of the use of thermal-hydraulic codes at Jozef Stefan Institute” – IJS Ljubljana (Slovenia), in 1994.
 - c) “Thermal-hydraulics and system code use at NPIC” - NPIC Chengdu (PRC), in 1994.
 - d) “Uncertainty Evaluation in system codes Prediction at CNEN” - CNEN Rio-de-Janeiro (Brazil), in 1995.
 - e) “Advanced Reactor design at NPIC”, Chengdu (PRC), in 1996.
 - f) “Validation and Verification of Emergency Operating Procedures for NPP Kozloduy, VVER 440 & 1000 Units”, (Energooproekt) Sofia (BG), in 1997.
 - g) “Evaluation of the safety and of the safety analyses performed for the Atucha PHWR NPP”, (NASA) Atucha (Arg), in 1998.
 - h) “Proposal of methodologies suitable for the assessment of Accident Management procedures in Romania”, Cernavoda CANDU NPP (Romania), in 1998.
 - i) “Evaluation and Licensing of NPP Modifications, PWR Westinghouse type” - IJS Ljubljana (Slovenia), in 1999.
 - j) “Establishing a Code user Training Course” - Consultant in Zagreb (Croatia), 1999.
 - k) “Application of Uncertainty in the Licensing Process of Angra-2 (PWR Siemens-KWU)” – CNEN Rio-de-Janeiro (Brazil) in 1999.
 - l) “Issuing a Guidance on Accident Analyses (Safety Series Report)” – Consultant in Vienna (Austria) in 1999.
 - m) “Inter-comparison and Validation of Computer Codes for Thermal-hydraulic Safety Analyses of Heavy Water Reactors” – Consultant in Vienna (Austria) in 1999.
 - n) “Thermal-hydraulic and Fission Product Release Codes for Accident conditions in VVER Reactors” – AEOI/NPPD Tehran (Islamic Republic of Iran) in 2000.
 - o) “Inter-comparison and Validation of Computer Codes for Thermal-hydraulic Safety Analyses of Heavy Water Reactors” – Consultant in Vienna (Austria) in 2000, same topic as at the item m).
 - p) “Thermal-hydraulic and Fission Product Release Codes for Accident conditions in VVER Reactors” – AEOI/NPPD Tehran (Islamic Republic of Iran) in 2001, same topic as at the item n).
 - q) “Improving public perception of the Nuclear Technology” – Invited Expert to a Workshop held in Ljubljana (Slovenia) in 2001.
 - r) “Issuing a Guidance on Accident Analyses (Safety Series Report)” – Consultant in Vienna (Austria) in 2001 and 2002.
 - s) “Inter-comparison and Validation of Computer Codes for Thermal-hydraulic Safety Analyses of Heavy Water Reactors” – IAEA Advisory Group Meeting in Vienna (Austria) in 2001, same topic as at the item o).

- t) “Accident Analysis” – AEOI/NNSD Tehran (Islamic Republic of Iran) in 2001.
- u) “To plan a CRP on Accident Analysis of Research Reactors” – Consultant in Vienna (Austria) in 2002.
- v) “To plan a CRP on Natural Circulation Phenomena, Modeling and Reliability of Passive Systems that utilize Natural Circulation” in Vienna (Austria) in 2002.
- w) “To develop a Technical Document on Uncertainties in Accident Analysis” in Vienna (Austria) in 2002 and 2003.
- x) “Inter-comparison and Validation of Computer Codes for Thermal-hydraulic Safety Analyses of Heavy Water Reactors” – IAEA Advisory Group Meeting in Vienna (Austria) in 2002 and 2003, same topic as at the item s).
- y) “Thermal-Hydraulic Analysis Principles” – AEOI/NPPD Tehran (Islamic Republic of Iran) in September 2003, same topic as at the item p).
- z) “To issue a Report on Safety Analysis for Research Reactors” in Vienna (Austria) in 2003.
- aa) “Preparation of the Course on Natural Circulation in Water Cooled Nuclear Power Plants” in Vienna (Austria) in 2003.
- bb) “Thermal-Hydraulic Analysis Principles” – AEOI/NPPD Tehran (Islamic Republic of Iran) in December 2003, same topic as at the items p) and y).
- cc) “Preparation of the Course on Natural Circulation in Water Cooled Nuclear Power Plants” in Vienna (Austria) in 2004, same topic as at item aa).
- dd) “Thermal-Hydraulic Analysis Principles” – AEOI/NPPD Tehran (Islamic Republic of Iran) in June 2004, same topic as at the items p), y) and bb).
- ee) “To plan an IAEA TM concerning the <The use of Best Estimate approach in licensing with the use of Uncertainty>” in Vienna (Austria) in Oct. 2004.
- ff) “Thermal-hydraulic Analyses for Bushehr NPP” – IAEA Headquarter, Vienna (Austria) in Nov. 2005, same topic as at the items p), y), bb) and dd).
- gg) “Management of Regulatory Safety Assessment Activities” – JSI, Ljubljana (Slovenia) in Feb. 2006.
- hh) “Neutron kinetics, radiological, PTS, thermal-hydraulic, severe accident and related uncertainties interactions following PRISE in VVER-440” – IAEA Headquarter, Vienna (Austria) in March 2006.
- ii) “To write an IAEA safety guide on Safety Guide on Verification and Validation of Computational Tools for Accident Analysis” – IAEA Headquarter, Vienna (Austria) in May 2006 and in Oct. 2006.
- jj) “Workshop on thermo-hydraulic analyses of BNPP-1” – Vienna (Austria) in Dec. 2006, same topic as at items p), y), bb), dd) and ff).
- kk) “To plan the Course on Natural Circulation in Water Cooled Nuclear Power Plants” – Vienna (Austria) in Dec. 2006, same topic as at item aa).
- ll) “To update six Natural Circulation lectures for the ‘INL-Idaho’ 2008 and the ICTP Course 2008” in Dec. 2007.
- mm) “To review the TECDOC dealing with thermal-hydraulic phenomena in new generation reactors” in April 2008.
- nn) “To review the Chapter 15 of the FSAR of the Bushehr VVER-1000 reactor” in Vienna, April 2008.
- oo) “Regional Workshop on Application of CFD Codes in Nuclear Safety”, in Budapest, June 2008.
- pp) “To review the Chapter 15 of the FSAR of the Bushehr VVER-1000 reactor” in Vienna, November 2008.
- qq) “To review the Chapter 15 of the FSAR of the Bushehr VVER-1000 reactor” in Tehran, December 2008.
- rr) “IAEA-TC Regional Workshop on Advanced Safety Assessment Tools and Methods (including BEPU evaluations), Dubrovnik, Croatia, 25-29 May 2009.
- ss) “IAEA BNPP-1 Neutronic Workshop” – Tehran, 8-12 August 2009.
- tt) “CS to finalize the CRP on uncertainty” – Vienna (A), 2009.
- uu) “IAEA-TC Training Course on Evaluation of Uncertainties in Best Estimate (BE) Accident Analysis for Advanced PWR, Beijing, China, 12-16 October 2009.
- vv) “To review training program in nuclear safety (connected with SAET), Vienna (A), Nov. 2009.
- ww) “IAEA/Argonne Regional Workshop on Deterministic Safety Analysis as Part of Periodic Safety Reviews and Plant Life Extension” – Chicago, Nov. 9-13, 2009 and “Regional Training Course on Safety Assessment to Assist Decision Making, 15-26 Oct. 2012, repeated 14-25 Oct. 2013.
- xx) “To review training program in nuclear safety (connected with SAET), Vienna (A), Jan. 2010, continuation of topic at item vv); continuation on the same topic in Vienna (A) on September 2014.
- yy) “To contribute in writing a report on V&V of system thermal-hydraulic codes”, Vienna (A), Jan. 2010, July 2010, January 2011 and December 2011.
- zz) IAEA “Regional Workshop on the Use of CFD codes in Safety Analyses”, Zagreb (Croatia), March 22-26, 2010.
- aaa) IAEA “Regional Workshop on Application of Best Estimate plus Uncertainty (BEPU) Analyses Methods in Nuclear Safety”, Ljubljana (Slovenia), 12-16 April 2010.
- bbb) IAEA Workshop Start-up Experiment of the BNPP-1 for the Completion of NPP Database and Validation of Models for Accident Analysis, Tehran (Iran), 11-14 July 2010.
- ccc) IAEA-TC National Workshop on the Use of CFD Codes in Safety Analyses, Harbin (China), Sept. 27-30, 2010.

- ddd) IAEA TC Course «Formation de Formateurs en Thermo-hydraulique Nucléaire», COMENA, Alger (Algérie) 10-14 Oct. 2010.
- eee) IAEA TC Course “Application of Deterministic Best Estimate (BE) Safety Analysis for Advanced NPP”, AERB, Mumbai (India), 13-17 Dec. 2010.
- fff) IAEA TC Course “Developing Capabilities for Nuclear Safety Operational Analysis for the new Power Upgrade for Laguna Verde NPP”, ININ, Ocoyoacac (Mexico), January 25-27, 2011, repeated, same place, January 22-26, 2012.
- ggg) “Regional Workshop on Advances in Deterministic Safety Analyses including the Application of Computational Fluid Dynamics”, Ljubljana (Slovenia) 21-25 March 2011.
- hhh) IAEA training “Development of Methodology on Integrated Approach to Evaluation of Safety Design Margin for nuclear power plants”, Vienna (Austria), Aug. 31 – Sept 2, 2011.
- iii) IAEA “Workshop on Safety Principles and DSA specially focusing on DID and Integrated risk informed decision making”, Tehran (Iran), Sept. 25-28, 2011.
- jjj) IAEA “The Use of CFD Codes in Safety Analyses”, Beijing (PRC), 7-11 Nov. 2011.
- kkk) IAEA-JRC-GRS Regional Workshop on Safety Assessment of Advanced and Innovative (GEN III+ and GEN IV) Nuclear Power Plants, Garching, (Germany), 21-25 Nov. 2011, repeated Budapest (Hungary), May 7-11, 2012, repeated Dubrovnik (Croatia), May 6-10, 2013.
- lll) "CS to design a CFD-CRP" - Vienna, Feb. 2012.
- mmm) IAEA TC Project BRA 20-03 – Course/Workshop Implementing Strategies to Improve and Strengthen Human Resources in Nuclear Science Competences - Analysis with RELAP code - Sao Paulo, Brazil, 21 – 25 May 2012
- nnn) CS for a new definition of Safety Margins – Vienna, Aug. 2012 and March 2013.
- ooo) IAEA TC Project “Regional Workshop on Advanced Safety Assessment Methods (BEPU, CFD, Coupled Codes, etc.) National Atomic Energy Agency (PAA), Warsaw, PL, 8-12 Oct. 2012, repeated Ljubljana (Slovenia), Sept. 16-20 2013.
- ppp) IAEA webinar (the only one lecturer) for strengthening the Safety Assessment Capabilities in South-East Asia, Aug. 28-30, 2013 and July 30-31, 2014 (see also list of invited lectures).
- qqq) CS for integration of DSA and PSA in Nuclear Reactor Safety – Vienna, Oct. 2013.
- rrr) IAEA Asian Nuclear Safety Network (ANSN), Topical Group on Safety Analysis (SATG) - First ANSN/SATG Expert Mission on Gap Finding in Safety Analysis Capabilities - National Nuclear Agency, Jakarta-Serpong, Indonesia 28 Oct. - 1 Nov. 2013.
- sss) IAEA TC Project UAE-2003 National Training Course on Probabilistic and Deterministic Safety Analyses, Abu Dhabi, United Arab Emirates, 10 - 14 Nov. 2013.
- ttt) IAEA TC Project to Review Draft TAEK R&A Guidelines for ECCS Related Chapters of PSAR (Akkuyu NPP), TAEK, Ankara, Turkey 26 - 30 May 2014.
- uuu) IAEA ANSN Regional Workshop to Conduct Safety Case Exercise of Safety Analysis Using RELAP5 and Annual Meeting, KINS, Daejeon, South Korea, June 30 - 4 July, 2014.
- vvv) IAEA Workshop on Application of Specific Computer Codes for Safety Review, PAA, Warsaw (PL), Nov. 16 – 20, 2015.
- Member of Committees that evaluated curricula for the following positions:
 - a prize given in the occasion of the 10th Int. Heat Transfer Conf., Brighton (UK) - 1994;
 - a research proposal at the Slovenian Ministry of Technology, Ljubljana (Slovenia), 1995 and 1997;
 - a position of Visiting Lecturer at University of Lappeenranta (Finland), 1996;
 - a senior staff position at INEL (Idaho, USA), 1996;
 - a position of "Research Director" at CEA (Cadarache, F), 1996;
 - a position of "Senior Expert" at CENG (Grenoble, F), 1997;
 - a position of "Associate Professor" at Pennsylvania State University (USA) 1997;
 - a position of "Research Adviser" at IJS (Ljubljana, SLO), 1998;
 - a position of “Full Professor” at the University of Ljubljana (Ljubljana, SLO), 1999;
 - a position of “Associate Professor” at University of Maryland (USA) 2001;
 - a position of “Full Professor” at the University of Illinois at Urbana-Champaign (Illinois, USA), 2003;
 - Honorary Professor at University of Pisa of a Professor from FZJ (Germany), 2004;
 - Honorary Professor at University of Pisa of a Professor from UPC (Spain), 2005;
 - a position of “Full Professor” at the Jao-tong University (Shanghai, China), 2005;
 - a position of “Full Professor” at the UPC (Barcelona, Spain), 2006;
 - a position of Senior Researcher, “CS6”, at AECL (Chalk River, Canada), 2006;
 - a position of “Full Professor” at KTH (Stockholm, Sweden), 2007-2008;
 - granting the tenure to an “Associate Professor” at McMaster University (Canada), 2008;
 - granting the tenure to an “Associate Professor” at OSU (Oregon, US), 2008;
 - a position of “Full Professor” at OSU (Oregon, US), 2009;
 - two positions of Associate Professor at University of Bologna (I), 2010;

- a position of full professor at University of Geneva (CH), 2010 (consultancy related to candidates CV).
 - a position of associate professor at University of Rome 'La Sapienza' (I), 2012;
 - a position of Research Advisor at IJS in Ljubljana (Slo), 2012;
 - lifetime award for excellence at INL (ID, US), 2012;
 - a position of full professor at University of Lappeenranta (SF), 2012;
 - a position of full professor at University of Oregon in Corvallis, Oregon (US), 2013;
 - two positions of researcher at Polytechnic University of Torino (I), 2016;
 - a position of distinguished professor in one US university, 2017, 2020;
 - a professor position at University of Catalonia (UPC) in Barcelona, 2020.
- Member of Committees that evaluated Research Proposals. The Committees are organized by:
 - Slovenian Ministry of Science and Technology in 1997, 2007 and 2019;
 - Slovenian Ministry of Education, Science and Sport in 2001;
 - Croatian Ministry of Science and Technology in 2007;
 - Brazilian Ministry of Science and Technology in 2015.
- Reviewer of several (400+) papers submitted to International Journals (not all of them listed below):
 - a) Nuclear Engineering and Design (J. NED);
 - b) Experimental Thermal and Fluid Science;
 - c) International Journal of Multiphase Flow (Elsevier IJMF);
 - d) Nuclear Technology (J. NT);
 - e) Nuclear Technology/Fusion;
 - f) Nuclear Science and Engineering (J. NSE);
 - g) Mechanical Engineering (Strojniski Vestnik);
 - h) Reliability Engineering and System Safety (J. RESS);
 - i) International Journal of Heat and Mass Transfer Elsevier Journal J HMT);
 - j) Frontiers of Energy and Power Engineering;
 - k) Science and Technology of Nuclear Installations (J. STNI);
 - l) Nuclear Technology and Radioprotection;
 - m) Chemical Engineering Research and Design (J. CHERD);
 - n) Annals of Nuclear Energy (J. ANE);
 - o) Nuclear Engineering and Technology (J. NET);
 - p) International Journal of Thermal Sciences (J. THESCI);
 - q) Progress in Nuclear Engineering (J. PNE);
 - r) IEEE Transactions on Nuclear Science (IEEE, TNS);
 - s) Numerical Methods in Heat and Fluid Flow (nm-HFF);
 - t) Energies (MDPI.com);
 - u) Nuclear Energy Science & Power Generation Technology (JNESPGT);
 - v) Computers and Fluids (Elsevier J. CAF);
 - w) International Journal Nuclear Engineering (IJNE);
 - x) Advances in Multimedia (MTS, Hindawi);
 - y) Applied Physical Science International (IKP Journal);
 - z) Physical Science International Journal;
 - aa) World Journal of Nuclear Science and Technology (WJNST);
 - bb) Heat and Fluid Flow (J. HFF);
 - cc) Applied Mathematical Modeling (J. APM);
 - dd) Thermal Science And Engineering Progress (Elsevier, TSEP);
 - ee) PLOS ONE Journal (PONE);
 - ff) Joule Journal (JOULE);
 - gg) Energy Procedia (Elsevier);
 - hh) Applied Science (MDPI);
 - ii) International Journal of Environmental Research and Public Health (IJERPH, MDPI);
 - jj) Mathematical Problems in Engineering (Hindawi);
 - kk) Journal of Ocean Engineering and Science (JOES, Elsevier);
 - ll) Journal Applied Thermal Engineering (ATE, Elsevier);
 - mm) Applied Radiation and Isotopes (ARI, Elsevier);
 - nn) Springer Nature Applied Science (SNAS, Springer);
 - oo) Journal Nanomaterials (MDPI);
 - pp) Energy Sources, Part A, Recovery, etc. (UESO, Taylor & Francis);
 - qq) Journal of Engineering Research and Sciences (JENRS);
 - rr) International Journal of Advanced Nuclear Reactor Design and Technology (JANDT, Elsevier);
 - ss) Engineering Application of Artificial Intelligence (EAAI, Elsevier).

- Reviewer of Technical Reports issued by OECD/CSNI, US NRC and IAEA.
- Reviewer of Elsevier Books (about fifteen till 2021).
- ‘Invited Lecturer’ in several International Conferences, e.g.:
 - ASTIC Advanced Course on Heat and Mass Transfer, Varna (BG), 1985 and 1986;
 - Int. Top. Meeting on Nuclear Reactors Thermal-hydraulics, Karlsruhe (FRG), 1989;
 - OECD/CSNI Spec. Meet. on Transient Two-Phase Flow - Aix-en-Provence (F), 1992;
 - X ENFIR, Aqua de Lindoia, SP, Brazil (panelist), 1995;
 - OECD/CSNI Spec. Meet. on the Use of Best Estimate code in Licensing in Ankara (Turkey), 1998;
 - ICONE-8, Baltimore (US), 2000.
 - OECD/CSNI Spec. Meet. on Advanced Thermal-hydraulic and Neutronics Codes: Current and Future Applications in Barcelona (Spain), 2000;
 - Panelist at XII ENFIR, Rio de Janeiro, Brazil 2000;
 - ANS Annual Meeting in Milwaukee, US 2001;
 - Panelist at ANS Annual Meeting in Milwaukee, US 2001;
 - ‘Fluidos’ in Buenos Aires, Argentina 2001;
 - INAC in Rio de Janeiro, Brazil 2002;
 - CNS in Montreal, Canada 2004;
 - ENIEF in Bariloche, Argentina 2004;
 - IAHR in Venice, Italy 2007;
 - ‘New Horizons...’ in Mumbai, India, 2008;
 - NURETH-13 in Kanazawa (Key-note Speaker), Japan, 2009;
 - Nuclear Power Summit 2009 “The future of nuclear power in Poland”, Warsaw, Poland, 2009;
 - ANS Annual meeting, San Diego (Ca, USA), 2010.
 - INAC-ENFIR in Belo Horizonte, Brazil, 2011.
 - Croatian Nuclear Society, (Zadar, HR), 2012;
 - NUTHOS-9 in Khaosung (Taiwan), 2012;
 - ANS embedded topical meeting ATH (San Diego, US), 2012;
 - ENFIR in Recife, Brasil, 2013;
 - AMNT in Berlin, Germany, 2015 and 2018;
 - NUTHOS-11 in Gyeongju, 2016;
 - Panelist at NURETH-17 in Xi’an (PRC) in relation to reliability of passive systems;
 - NENE (co-author of Prof. Maiorino invited paper) in Bled, Slovenia, 2017;
 - NISLA2018 in Buenos Aires, Argentina, 2018;
 - BEPU2018 in Lucca, Italy, 2018;
 - HND (co-author of Prof. Maiorino invited paper), Zadar, Croatia, 2018;
 - ANS-ATH, Paris, 2020 (conference cancelled due to Covid; paper in proceedings).
- ‘(Technical) Program Chairman’ or Key Organizer of:
 - a) ASME-JSME Symposium held in Hilton Head (SC, USA) on August 1995;
 - b) ASME-JSME Symposium held in San Francisco (Ca, USA) on July 1999;
 - c) International Meeting “30 Years Nuclear Research and Design Activities in Energoproekt Plc”, Varna (Bulgaria) on May 2000;
 - d) ENS TopSafe 2008 [Dubrovnik, Croatia] , 2012 [Helsinki, Finland] and 2017 [Vienna, Austria] (see also main bullet above);
 - e) IAEA BEPU International Workshops (Technical Meeting) in Pisa (I), Sept. 2005, Sept. 2009, June 2012, and June 2013;
 - f) ANS NURETH-15 [Pisa, Italy] 2013 (see also main bullet above);
 - g) ANS NUTHOS (Co-chair) in Qindao (PRC), 2018;
 - h) OECD/NEA/CSNI Specialists Meeting in Nuclear Thermal-hydraulics, Madrid (Spain), 2020.
- Chairman and/or Organizer of almost 100 sessions in Conferences since 1982 (see the publication list).
- Member of the Organizing Committee of International Conferences:
 - a) Specialists Meeting on Small Break LOCA Analyses, Pisa 1985,
 - b) Eurotherm Seminar on Natural Circulation in Industrial Applications, Pisa 1990,
 - c) New Trends in Nuclear System Thermal-hydraulics, Pisa 1994,
 - d) Eurotherm Seminar on Natural Circulation, Genoa 1999,
 - e) Commemoration of E. Fermi in the occasion of the 100th anniversary of his birth, Pisa 2001,

- f) IAEA-OECD Workshop on the Use of CFD codes for safety analysis of reactor systems, Pisa 2002,
 - g) ANS ATH Embedded Topical Meeting (Co-Chair), San Diego, 2012.
- Member of the Technical Committee in several International Conferences (see the publication list).
 - ‘ANS Award’ for the best paper at the ANS Winter Meeting - San Francisco (Ca, USA) 1991.
 - Preface Author of a ‘Special Issue’ of the J. ‘Nuclear Engineering and Design’, devoted to selected papers from the SBLOCA Conference held in Pisa (I), 1985.
 - ‘Guest Editor’ of a ‘Special Issue’ of the J. ‘Nuclear Engineering and Design’, devoted to selected papers from the OECD/CSNI Conference “4th Spec. Meet. On Transient Two-Phase Flow” - Aix-en-Provence (F), 1992.
 - Preface Author and ‘Guest Editor’ of a ‘Special Issue’ of the J. ‘Nuclear Engineering and Design’, devoted to selected papers from the EURO THERM Conference on Natural Circulation held in Genoa (I), 1999.
 - Guest Editor for the Special Issue of the J. Nuclear Engineering and Design, Perspectives in Nuclear Thermal-hydraulics, devoted to the memory of B. Sehgal, G. Yadigaroglu and G. Hewitt.
 - He cooperated in issuing different reports published by OECD/CSNI, IAEA and EC, e.g.:
 - a) OECD-NEA-CSNI / Co-Author (1 of 6) of the SOAR (State of the Art Report) on Two-phase Critical Flow, 1982.
 - b) OECD-NEA-CSNI / Co-Author (1 of 15) of the Report selecting Integral Test Facilities and Experiments suitable for System Codes Validation, 1987.
 - c) OECD-NEA-CSNI / Lead Author (1 of 7) of the SOAR on Thermal-hydraulics of ECCS, 1989.
 - d) OECD-NEA-CSNI / Co-Author (1 of 6) of the Report selecting Separate Effects Test Facilities and Experiments suitable for System Codes Validation, 1993.
 - e) OECD-NEA-CSNI / Co-Author (1 of 3) of a ‘Status Report’ dealing with the user effect on system codes calculations, 1995. Co-Author (1 of 4) of the follow-up of this report ‘Good Practices for user effect reduction’ in 1998.
 - f) OECD-NEA-CSNI / Co-Author (1 of 4) of a Report Evaluating the results obtained from International Standard Problems (ISPs) devoted to Small Break LOCA tests, 1996.
 - g) OECD-NEA-CSNI / Co-Author (1 of 2) of a ‘Status Report’ dealing with thermal-hydraulic phenomena expected in innovative reactors 1996.
 - h) OECD-NEA-CSNI / Editor and Lead Author (1 of 8) of a SOAR on the Stability of BWR, 1997.
 - i) OECD-NEA-CSNI / Lead Author (1 of 5) of a Report (summarizing the “UMS” activity) dealing with the application of five uncertainty methodologies to a SBLOCA problem, 1998.
 - j) OECD-NEA-CSNI Editor and Lead Author of the SOAR on Scaling, 2017.
 - k) IAEA / Co-Author of different ‘TECDOC’ reports dealing with transient thermal-hydraulic applications to Nuclear Power Plant Accident Analysis, 1998-2002.
 - l) IAEA / Co-Author (1 of 7) of a ‘Safety Report Series’ “Accident Analysis for Nuclear Power Plants”, 2002.
 - m) IAEA / Co-Author (1 of 8) of a ‘Safety Report Series’ “Accident Analysis for Nuclear Power Plants with Pressurized Water Reactors”, 2003.
 - n) IAEA / Co-Author (1 of 8) of a ‘Safety Report Series’ “Accident Analysis for Nuclear Power Plants with Pressurized Heavy Water Reactors”, 2003.
 - o) OECD-NEA Lead Author (CRISSUE-S Project Coordinator) of three reports summarizing the state of the art in the development and the application of coupled 3D Neutron Kinetics / Thermal-hydraulic techniques (EC partly funded CRISSUE-S project), 2004.
 - p) EC Editor (TACIS Project Director) of the Final Report “Deterministic Safety Technology in RBMK” (838 pages), 2005.
 - q) EC Editor (TACIS Project Director) of the Final Report “Accident Management Technology in VVER-1000” (1244 pages), 2006.
 - r) OECD-NEA-CSNI / Lead Author (1 of 2) of a Report (summarizing the “BEMUSE – Phase 2” activity) dealing with the revising of ISP 13 including sensitivity studies in view of the application of uncertainty methodologies to a LBLOCA scenario, 2006.
 - s) IAEA / Co-Author (1 of 5) of the ‘Safety Report Series’ No 52 dealing with the approaches to evaluate uncertainty in licensing analyses, 2008.
 - t) IAEA / Co-Author (1 of 15) of the ‘Safety Report Series’ No 55 dealing with the Research Reactor Safety Analyses, 2008.
 - u) IAEA / Co-Author (1 of 11) of the ‘Specific Safety Guide’, SSG-2 titled “Deterministic Safety Analysis for Nuclear Power Plants”, 2010.

- v) IAEA /Co-Author (1 of about 10) of Technical Reports dealing with Natural Circulation and Passive systems: TECDOC 1474 (2005), TECDOC 1624 (2009), 1677 (2012).
 - w) OECD-NEA-CSNI / Lead Author (1 of 4) and Editor of Scaling State of Art Report, 2017.
- Organizer of an OECD/CSNI ISP (International Standard Problem) based on the Piper-one facility (BWR simulator) designed and installed at University of Pisa, 1987-1989.
 - He took part in all ISPs organized by OECD/CSNI and IAEA in the area of nuclear reactor thermal-hydraulics in the period 1982-2010.
 - Selected in 1999 (till 2003) as 'Expert' by the European Union for services in developing countries 'SCR Service commun de gestion de l'aide communautaire aux pays tiers' (Sector 04 – Energy).
 - Supervisor of the activity carried out at University of Pisa by foreign researchers, coming from:
 - Energoproekt (BG) in 1989 – IAEA Fellowship.
 - NPIC (China) in 1994 – IAEA Fellowship.
 - CNEN (BRA) in 1994, 1996, 1998, 2001 and 2005 – IAEA Fellowship.
 - CNEN (BRA) in 2000 and 2001 (two scientists) – CNEN agreement.
 - CNEA (Arg) in 1994 and in 1999 – IAEA Fellowship.
 - CTMSP (BRA) in 1997 (2 scientists), 1998, 2002 and 2005 – Cooperation with University of Pisa.
 - CNEA (Arg) in 1997/98 – Cooperation with University of Pisa.
 - UPC, University of Barcelona (E) in 1998/99 – EU Fellowship.
 - CAB (Arg) in 2000 and in 2006 – IAEA Fellowship.
 - CEN (Alg) in 2000 – IAEA Fellowship.
 - AEOI (Iran) in 2001/02, in 2002/03 and 2004 (4 scientists) – IAEA Fellowship.
 - University of Valencia (Spain) in 2002 and 2004 – Cooperation with University of Pisa.
 - El-Sharif University of Teheran (Iran) in 2002.
 - Gidropress (Moscow, Russia) in 2002 – Consultancy to Univ. of Pisa.
 - University of Vienna (Vienna, Austria) in 2003/05 – VVER-1000 safety assessment.
 - Technical University of Sofia (BG) in 2004.
 - ARN (Arg) in 2004 and 2005 – Consultancy to Univ. of Pisa.
 - NA-SA (Arg) in 2004 – Consultancy to Univ. of Pisa.
 - University of Zagreb (Croatia) in 1986-2004 (various researchers) – Cooperation with University of Pisa.
 - BANG (Bangladesh) in 2004 – IAEA Fellowship.
 - ENEC (Egypt) in 2004 – IAEA Fellowship.
 - VUJE (Slovak Republic) in 2004 – Training at Univ. of Pisa.
 - NIKIET, EREC, Kurchatov, Gidropress (Russian Institutions, various experts) in 2004-2006 – TACIS Project framework (see above), Training and Technical Cooperation.
 - UJD (Slovak Republic) in 2004 – IAEA Fellowship.
 - Lowell University (USA) in 2005 – Cooperation with University of Pisa.
 - ENPRO (BG) in 2005 (2 scientists) – Cooperation with University of Pisa.
 - UPC, University of Barcelona (E) in 2005 and 2006 – Cooperation with University of Pisa.
 - TRNC (Libya) in 2005-06 – IAEA Fellowship.
 - AERB (India) in 2006 – Cooperation with University of Pisa.
 - PSU (USA) and Regulatory Authority (Thailand) in 2006 – Cooperation with University of Pisa
 - University of Tiziouzou (Algeria) in 2006/07 – Cooperation with University of Pisa.
 - AEC of Syria (Damascus) in 2007, two scientists – IAEA Fellowships.
 - European Commission, EURATOM (former Marie Curie) fellow in 2007-09
 - CNEN (BRA) in 2008 and 2009 (three scientists) – University of Pisa contract framework.
 - Atomic Commission of Pakistan in 2009 – IAEA Fellowship.
 - Centre de Recherche Nucléaire de Draria (Algeria) in 2009 – IAEA Fellowships.
 - Ghana Atomic Energy Commission, Legon-Accra (Ghana), 2 researchers in 2012 and 2013, one researcher in 2014-2016 – IAEA/ICTP Fellowships.
 - University of Sao Paulo – IPEN in the period 2015-2017.
 - Universidade Federal do ABC, Sao Paulo (Brasil) – professor in sabbatical year – in 2017-2018.
 - Amir Kabir University of Teheran (Iran) in 2017-2018.
 - EdF (France) in 2020.
 - Xi'an University (China) in 2021-2022.
 - He established different co-operations between Universities of Pisa, Roma and Genoa and foreign Institutions.

- He has been responsible of several research contracts at Universities of Pisa, Roma and Genoa.
- Co-author of more than 1000 published papers and reports and more than 1200 ‘internal’ reports. About 300 papers are published in International Journals.

3.2 List of key achievements

Concerned broad-area activities are:

- A) Nuclear Thermal-hydraulics – experiments
- B) Nuclear Thermal-hydraulics – analyses and NPP applications
- C) Nuclear Reactor Safety (NRS)

Within area A). A1) Characterization of TPCF, Blowdown, two-phase jet thrust and impingement ending-up in BLOWAES a software to derive cylindrical nozzle TPCF from DP signals. A2) SBLOCA and NC: scaling analysis to design and operate a BWR-ITF simulator (full height, full pressure, full linear power scaling), planning one OECD/NEA/CSNI ISP and one CT experiment. A3) Founding of SILENCE network of nuclear thermal-hydraulic experimentalists and establishing the SWINTH series of Conferences.

Within area B). B1) Procedures for consistent application of system thermal-hydraulics codes including V & V of codes and nodalizations and considering code couplings; B2) Quantification of accuracy of code calculation results (the FFTBM) at the basis of uncertainty and for suitable for V & V; B3) Approaches to scaling in system thermal-hydraulics; B4) Founding FONESYS network of thermal-hydraulic code developers; B5) Uncertainty method UMAE-CIAU.

Within area C).C1) The vision for nuclear thermal-hydraulics within the licensing and the NRS framework; C2) Exploiting the BEPU for LBLOCA and the Chapter 15 of the FSAR; C3) Proposing the BEPU approach for the overall FSAR and the concept of extended Safety Margin; C4) Putting the bases for establishing a new safety barrier in existing NPP.