

## Working experience

<p><b>From October 2005 to present</b>, Politecnico di Torino, <b>Associate Professor</b> (full-time, 08/A2 - SSD ING-IND/28 Ingegneria e Sicurezza degli Scavi); I Faculty of Engineering, and currently Environment, Land and Infrastructures Department - <b>Teaching</b> various Msc. degree and doctoral courses in the field of Excavation Engineering, Underground Works, Quarrying, Tunnelling and Demolition Techniques;</p> <p><b>Setting up research directions</b>, and building up research projects in the areas of (i) Excavation techniques (both Open pit and Underground), (ii) vibrations monitoring and control, (iii) Scale-effects in rock excavation, (iv) Rock-tools interaction, and (v) Raw-materials exploitation and valorization of by-products;</p> <p><b>Collaborating</b> with leading international universities and industries on joint research projects</p>
<p><b>From 1992 to 2005</b> (confirmed on April 1995), Politecnico di Torino, <b>Assistant Professor</b> (full-time, SSD ING-IND/28 Sicurezza e Ingegneria degli Scavi); I Faculty of Engineering; Department of Geo-resources and Land - <b>Teaching</b> undergraduate courses in the field of Excavation Techniques, Mining and Quarrying; performing research activities focused on rock materials characterization (mainly by lab tests), simulation of exploitation scenarios (open-pit) by geo-statistical methods.</p>
<p><b>From 1988 to 1992</b> (confirmed on 1989) <b>National Research's Council</b>, c/o Politecnico di Torino (public), Corso Duca degli Abruzzi 24, 10129, Torino, Italy, <b>Researcher at CSPM- Centro Studi Problemi Minerari</b>, (Scientific Sector: Physics of Rocks and Geotechnologies), <b>Collaboration in numerous experimental and theoretical researches</b>, mainly in the field of rock material characterization for excavation, processing and utilization, with particular attention to studies on the interrelationship between the mechanical, structural and mineralogical characteristics of the materials.</p>
<p><b>From 1996 to present: CNR-IGG</b>, c/o Politecnico di Torino, <b>Research responsible</b> of the Institute of Environmental Geology and Geoengineering - Section of Turin - of the National Research Council</p>

## Education and Training

<p><b>1989</b> Politecnico di Torino, <b>PhD in Underground Resources Engineering</b></p>
<p><b>1985</b> Professional Engineering Qualification</p>
<p><b>1984</b> Politecnico di Torino, <b>MSc. Degree</b> in Mining Engineering</p>
<p><b>2003-2004</b> Università degli Studi di Genova-Facoltà di Scienze Matematiche, Fisiche e Naturali, <b>Master in Explosive Materials</b></p>

## Scientific responsibility (Principal Investigator) of competitive National and International research projects, awarded through a peer-review process

- 2019-2020: DUO India Project, in cooperation with the Dhanbad University, Jarkand (India)
- 2018-2019: ENERBLAST Project, in cooperation with Adolfo Ibanez University, Santiago (Chile)
- 2016-present. Recognized Raw Material commitment (EIP's Strategic Implementation Plan, European Commission). Title: "Extended life tools for extreme drilling and coring operations on complex rock materials – ExECRoMe". Duration: from 14-03-2016 to present.
- 2008-2011. Joint research project (Politecnico di Torino, LTF-Lyon Turin Ferroviaire). Responsible WP3 "L'influenza delle tecniche di scavo e di abbattimento sul riciclo del marino" within the project "Innovative methods for the eco-compatible and sustainable recycling of muck from tunnel excavation-REMUCK". Duration: from 27-10-2008 to 14-04-2011.
- 2008–2010. Indo-Italian Executive Programme of S&T Co-operation between the Politecnico di Torino and the University of Dhanbad, India. Role: Responsible (Italian side).
- 2001–2003. Joint Research Project OSNET-Ornamental Stones Network. Role: Responsible of the WG: "State of the Art in Dimension Stones quarrying". Competitive and Sustainable Growth Programme, Contract n. G1RT-CT-2001-05019. Duration: from 21-10-2001 to 26-09-2003.

## Research grants as Technical Staff Member

- 2008-2011. Joint research project of the Politecnico di Torino on "Innovative methods for the eco-compatible and sustainable recycling of muck from tunnel excavation, also considering the potential content of noxious minerals \_ REMUCK". Role: Technical Staff Member.

- 2005–2006. Joint Research Project of the Politecnico di Torino with Provincia di Varese (n. 188/2006 - Settore Patrimonio, Beni Architettonici, Edilizia e Servizi Scolastici) Role: Technical Staff Member. Title: Execution, processing and interpretation of vibrometric tests for the evaluation of the effects of blasts for the project "Hermitage of Santa Caterina del Sasso".
- 2003–2004. Joint Research Project of the Politecnico di Torino with Enviars sas. Role: Technical Staff Member. Title: "Progettazione preliminare, definitiva di appalto e direzioni lavori per la demolizione controllata con esplosivo di un edificio di civile abitazione sito in Torino".
- 2000–2002. EUREKA EI 2280 Joint Research Project. Role: Technical Staff Member. Title of the project: "ISPEC: Innovative Stone Process Ecological Cutting", Area 1: Development of models aimed at the optimization and personalization of tools and stone materials.
- 1997–2002. Joint Research Project of the Politecnico di Torino. Role: Technical Staff Member. Title of the project: "Validation of the Expert System: Excavation in cohesive materials". The project was developed on request of the Ministry of University and Scientific and Technological Research and CO.RI.S.T.A.

## **National and international reputation and professional activity for the scientific community**

- Participation in the Editorial Board of Journals with international reputation (in the role of Associate Editor or equivalent), participation in the Editorial Board of book series, encyclopedias and essays of recognized prestige
- Member of Editorial Board of "Minerals", (ISSN 2075-163X; CODEN: MBSIBI) an international peer-reviewed open access journal of natural mineral systems, mineral resources, mining, and mineral processing; Minerals is published monthly online by MDPI (from 2020).
- Member of Editorial Board of International Journal of Mining and Mineral Engineering, Interscience Publishers (ISSN: 1754-890X -Print, ISSN: 1754-8918 -Online), from 2010
- Member of Editorial Board of Mining Science Journal (already Prace Naukowe Instytutu Gornictwa Politechniki Wroclawskiej), included in "the Emerging Sources Citation Index (ESCI) by Thomson Reuters Web of Science™ Core Collection", from 2015
- Associate Editor REM: Revista Escola de Minas (Printed version ISSN 0370-4467; On-line version ISSN 1807-0353), from 2015.
- **Reviewer** for several leading international journals.

## Official research and/or teaching and/or fellowship roles, positions as Scholar/ Visiting Professor in international highly qualified universities and research centres

- 2019 – Outgoing mobility at University of Lisbon – Erasmus + program (Topic: Drill & Blast)
- 2014-2015 - Special Visiting Professor PVE, on the subject: Integrated Geology and Blasting in the comminution process of a small-scale mine - research activities in the Experimental Mine of the USP Center for Responsible Mining"; research carried out at USP, Universidade Polit cnica de S o Paulo, Departamento de Engenharia de Minas e de Petroleo, Brazil (from October 10, 2014 to April 5, 2015)
- 2015- Visiting Professor at ITU - Istanbul Technical University, Istanbul, Turkey, experimental research on mechanized excavation in tunnelling, with particular reference to the study of the rock-tool interaction through laboratory tests at different scales (from 01-05-2015 to 30-09-2015)

## Selection of talks delivered at public and private institutions

- Invited lecturer at: National Meeting of Explosive Devices, organized by; "Comando Generale dell'Arma dei Carabinieri, Ufficio Armamento ed Equipaggiamenti Speciali", Roma; tile: "Emulsion Explosives", June 2004.
- Invited lecturer at "Ecole Nationale Sup rieure d'Ing nieurs (ENSI) de Bourges" (France), Title: "Rock Blasting and Environmental Impacts". April 2004
- Invited lecturer at CEMEX Trademarks Worldwide Ltd. – Biel, (Switzerland), Title: "Exploration methods and excavation techniques for civil and mining purposes" March 2007
- Invited talk at "Universidad Polit cnica de Cartagena y Consejer a de Industria y Medio Ambiente de la Comunidad Aut noma de la Regi n de Murcia (Spain), Title: " *T cnicas de Explotacion de las Rocas Ornamentales en Italia: Racionalizaci n, Desarrollo y Perspectivas* ". March 2007.

- Cycle of seminars at "Pakistan Stone Development Company", Islamabad (Pakistan), title: "Technologies and equipment for the exploitation of dimension stones"; 3-days talks given to technicians and specialists in the sector of Stones Exploitation. June 2011.
- Invited lecturer at "Ben Gurion University of the Negev, Be'er Sheva (Israel), on the subjects: "Demolition of civil and industrial buildings" e "Monitoring of vibrations induced by Drill & Blast". December 2011.
- Invited lecturer at "PPGEM, Departamento de Engenharia de Minas da Universidade Federal do Rio Grande do Sul, Porto Alegre (Brazil), on the subjects: "Evolution of drilling techniques"; "Rock Blasting and over-break control"; "Tunnelling". April 2012.
- Invited lecturer at "PPGEM, Departamento de Engenharia de Minas da Universidade Federal do Rio Grande do Sul, Porto Alegre (Brazil), on the subject: "Design criteria for production blasting in an Italian underground limestone quarry". October 2014.
- Invited lecturer at "Universidad de las Fuerzas Armadas - ESPE, Quito (Ecuador), on the subject: "Excavation by Drill & Blast – System Components". March 2018.

#### Offices in the Governing bodies of national and international scientific societies

- Member of "Istituto Ascanio Sobrero per l'esplosivistica e la detonica" since 2001 (appointment date: 01-01-2001).
- Member of EU-Excert "Certifying Expertise in European Explosives Sector", from 01-01-2004 to 31-12-2005.
- Member of International Society of Explosives Engineers (ISEE), from 01-01-1998 to 31-12-2013
- Member of International Organizing Committee "Mine Planning and Equipment Selection (MPES), since 2004.
- Member of the Committee Board of GEAM Association ("*Associazione Georisorse e Ambiente*") since 2015
- President of SOMP – Society of Mining Professors, from September 2016 to July 2017
- Past President of SOMP – Society of Mining Professors, from July 2017 to present
- Member, appointed by the Politecnico di Torino, of European Innovation Partnership on Raw Materials (EIP) – High Level Steering Group (HLSG), since 2017.
- Member of SME – Society of Mining Engineers (Society for Mining, Metallurgy & Exploration), since 2017.
- "Project Evaluation Process", in the context of "EIT Raw Materials", of several European Projects on the subject of "Education" (KIC added value activity), 2017.
- Member of the EFEE – European Federation of Explosives Engineers "Pan-European Certificate for Shotfirers and blast designers", since 2028

#### Participation in international conferences, as a distinguished invited speaker; participation in the scientific committees of International Conferences

- Organizer and Editor of the 15th International Symposium on Mine Planning and Equipment and Selection (MPES), held in Turin on 20-22 September 2006
- Invited speaker at the II workshop of ISEE (International Society of Explosives Engineers) UFRGS Brazil, held in Porto Alegre, Brazil, on 24-25 October 2014
- Invited speaker at 11th International Symposium on Rock Fragmentation by Blasting (FRAGBLAST11) held in Sydney, Australia, on 24-28 August 2015
- Member of the Organizing Committee of the 24th World Mining Congress, held in Rio de Janeiro (Brazil) on 18-21 October 2016. Referee of the papers in the "Surface Mining" sector.
- President of the 28th Annual Meeting and Conference of the Society of Mining Professors (SOMP), held in Turin on 03-06 July 2017
- Member of the Scientific Committee of REMTECH ("*Bonifiche dei Siti Contaminati e Riquilificazione del Territorio*") from 01 October 2008 to 31 December 2010.
- Member appointed, on proposal of the National University Council, of the Technical Supervisory Committee of the Ministry of the Interior, Department of Public Security, Office for Police Affairs, Arms and Explosives Area, Rome, from 01-01-2010 to date

- Member of the "General Committee" of Society of Mining Professors (SOMP), from 2015 to date

### **Teaching activity**

- Excavation Engineering and Mining Plants, MSc in in Petroleum & Mining Engineering – path Mining, Politecnico di Torino, main lecturer and course responsible.
- Underground Works and Mining, MSc in in Petroleum and Mining Engineering – Path Mining, Politecnico di Torino, lecturer of a part of the course.
- Tashkent Turin Polytechnic University (TTPU), Tashkent, Uzbekistan  
Safety and Civil Protection (Integrated to "Applied Geology"), BSc in in Civil Engineering.

### Other teaching activities

- "Mining Engineering Challenge Project 2017" between Politecnico di Torino and UAI-Universidade Adolfo Ibanez (Chile); co-responsible of the teaching project on "Undreground exploitation" (AY 2016-2017)
- "Università degli Studi di Parma", Engineering Faculty, MSc in Civil Engineering, course of "Gallerie"; invited to held a cycle of classes on the Topic: "Tunnelling: D&B techniques and Mechanical Excavation"; AY 2007-2008, 2010-2011, 2011-2012.
- Master in Tunnelling and Tunnel Boring Machines, Turin - Topics: *Drill and blast methods; Blast design and control of induced vibrations*; Years: 2003, 2005, 2009; 2011; 2013;
- CINEAS – Politecnico di Milano, Topics: *Demolition of Concrete Structures* ("Demolizione di strutture in calcestruzzo"); *Demolition of steel structures*; AY 2009 – 2010
- Master in Safety Engineering and Risk Analysis-Module: Safety in temporary and mobile construction sites, COREP, Turin; topic: *Excavation and rock splitting technologies*; Years: 2000, 2002, 2003; Topic: Structures, techniques and technologies applicable to excavation and demolition sites (4 hours modules); Years: 2004, 2005, 2006

### Formal responsibility of PhD courses in Italian and/or foreign universities

- Demolition Techniques, Civil and Environmental Engineering Ph.D. course (4 CFU) offered to all PhD students of Politecnico di Torino, main lecturer and course responsible, AY 2007/08 - present.
- Rock Blasting and control of Unwanted Effects, Civil and Environmental Engineering Ph.D. course (4 CFU), offered to all PhD students of Politecnico di Torino, main lecturer and course responsible, AY 2017/18

### Institutional offices in teaching and research structures

- 2017-present. Member of the Commission for the implementation of the new "PRAE" ("Piano Regionale Attività Estrattiva").
- 2011-present. Member of the PhD in Civil-Environmental Engineering, Politecnico di Torino.
- 2003-2004. Member of the PhD board in Environmental Geo-Engineering ("Dottorato di ricerca in Geoingegneria Ambientale"), Politecnico di Torino.
- 2010-2013. Member of executive board ("giunta di collegio"), Environment, Land and Infrastructures Department, Politecnico di Torino.
- 2003-2012. Expert member of the Province of Torino, as part of investigations Services Conference, Sector "Mining Techniques" ex II.rr. 69/1978 e 44/2000., N. 259-249352"). Provincia di Torino Area Ambiente, Parchi, Risorse Idriche e Tutela della Fauna Servizio Valutazione di Impatto Ambientale e Pianificazione e Gestione attività estrattiva.

### **Services as an Examiner**

#### International level

- 2006 - Ph.D. defense jury, University of Vigo (Universidad de Vigo, Escuela Tecnica Superior de Ingegneros de Minas), Vigo, Spain.
- 2006 - Ph.D. defense jury on "Impact de fortes explosions sur les batiments representatives d'une installation indutrielle"), Université d'Orléans, Discipline Mécanique – Energétique, Orléans, France.

- 2009 - Ph.D. defense jury activity "Dianostico Tecnologico del Setor de los Aridos y su Aplicacion a la Region de Murcia"), Universidad Politécnica de Cartagena, Departamento de Ingenieria Minera, Geologica y Cartografica, Cartagena, Spain.
- 2018 – Member of technical evaluation committee for a tenure-track position of Associate Professor in Mining Engineering at Polytechnic University of Catalonia. The evaluation process for this position is International.
- 2018 - Member of the International board for the assessment of the final activities of Ph.D. students, Ph.D. program in Mining Engineering, UNSW – University of New South Wales, Sydney.
- 2019 - Member of the International board for the assessment of the final activities of Ph.D. students, Ph.D. program in Mining Engineering, at WITS University, Johannesburg (South Africa).

#### National level

- President of the technical evaluation committee for a tenure track position of Associate Professor in Raw Materials' Engineering (08A2 – ING/IND 29), at Politecnico di Torino University, 2019.
- President of the evaluation Committee (Civil-Environmental Section) of the National Habilitation exam for the Engineering profession ("Esami di Stato"), Politecnico di Torino. Year 2020 (I and II Session).
- Member of the evaluation Committee of the National Habilitation exam for the Engineering profession ("Esami di Stato"), Politecnico di Torino. Years (I and II Session): 2004, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2016.
- President of the evaluation Committee (Civil-Environmental Section) of the National Habilitation exam for the Engineering profession ("Esami di Stato"), Politecnico di Torino. Year 2014 (I Session).
- President of the evaluation Committee (Civil-Environmental Section) of the National Habilitation exam for the Engineering profession ("Esami di Stato"), Politecnico di Torino. Year 2017 (I and II Session).
- Member of the Teaching Committee ("Commissione Didattica") DIATI, Politecnico di Torino. Years: 2006-Present
- Member of the National board for the assessment of the final activities of Ph.D. students, Ph.D. program in Environmental Geo-Engineering, Politecnico di Torino: XVII Cycle (2006), XX Cycle (2008); PhD program in Civil Engineering, Politecnico di Torino: XXIX Cycle (2017); PhD program in Civil-Environmental Engineering, Politecnico di Torino: XXVIII Cycle (2016), XXX Cycle (2018).
- Member of the National board for the assessment of the final activities of Ph.D. students, Ph.D. program in Geo-Engineering and Environmental Technologies ("Geo-ingegneria e Tecnologie Ambientali"), Università degli Studi di Cagliari, XX Cycle (2008), XXIV Cycle (2013)
- Member of the National board for the assessment of the final activities of Ph.D. students, Ph.D. program in Geo-Resources and Technologies ("Georisorse e Tecnologie), Università degli Studi di Bologna, XVIII Cycle (2007).
- Responsible for the allocation of part-time grants - students in Environmental and Land Engineering ("Ingegneria per l'Ambiente e il Territorio"), DIATI, Politecnico di Torino, from AY 2004/05 to AY 2014/2015.
- 2001 – Member of technical evaluation committee for a faculty position of Assistant Professor (Sector Ing-Ind/28) at "Università degli Studi di Cagliari", Cagliari, Italy. The evaluation process for this position is nationwide, and the nomination of the evaluation committee is based on elections from the whole Italian board of professors of the sector. Members: prof. Raimondo Ciccu, prof. Sante Fabbri, Dr. Marilena Cardu.
- Department and Faculty level: Member of technical evaluation committees for positions of Research Assistant or fellowships c/o Engineering Departments of Politecnico di Torino (from 2000 to 2020).