
Curriculum Vitae

of

CARLO CALLARI, PH.D.

ASSOCIATE PROFESSOR OF SOLID AND STRUCTURAL MECHANICS,
FORMER ASSISTANT PROFESSOR OF GEOTECHNICAL ENGINEERING

TAX ID CODE: CLLCRL68A15G273A



University of Molise, Campobasso, Italy
DiBT Department – Engineering Division

carlo.callari@unimol.it - [web-page](#)



Professor of “[Tunnels](#)” at Universities of Rome “Tor Vergata” and of Molise, Italy
callari@uniroma2.it



NOTE: this file includes links to documents available on the web

Cliccare [qui](#) per la versione italiana

1. General information

Education

1997 - PhD in Civil Engineering, University of Rome “Tor Vergata” (tutors: F. Auricchio, E. Sacco).

1993 - M.Sc. in Civil Engineering (GPA 100/100 cum laude), University of Rome “Tor Vergata” (tutor: R. Jappelli).

Academic experience

2006-now - Associate Professor of Continuum and Structural Mechanics, University of **Molise**, DiBT.

1999-06 - Assistant Professor in Geotechnical Engineering, University of **Rome “Tor Vergata”**, Department of Civil Engineering.

1997-98 - Research Fellow, University of **California at Berkeley**, Department of Civil and Environmental Engineering.

National Scientific Qualifications as Full Professor

“**Geotechnics**” 2019-2028 (ICAR/07); “**Continuum and Structural Mechanics**” 2020-2029 (ICAR/08).

Awards

[2015 - V.I.P. grant of Ruhr University Bochum, Germany.](#)

[2022,2019,2018,2017,2016,2015,2014,2012,2010 - n. 9 “Professeur invité” grants at Ecole Centrale de Lyon, France.](#)

[2022 “Professeur invité” at the'Ecole Normale Supérieure Paris-Saclay, France.](#)

2013,2011- n. 2 awards by the Italian Ministry of Research (DM 26/07/2013) for scientific accomplishments.

1999 - CNR Short-term Mobility Program.

1997-98 - NATO–CNR “Advanced Fellowships Programme 1996”.

1994 Delegate designated by the Italian Geotechnical Society (AGI) at the *8th European Young Geotechnical Engineers Conference – EYGEC*, Starà Lesná, Slovak Republic 1994

Professional and service activities

2022-24 – [Elected member of the Board of Directors](#) of the [Italian Society of Tunnels \(SIG\)](#).

2021-now – [Editor of the of the WOS-ESCI indexed Journal “Tunnels and Major Underground Works / Gallerie e Grandi Opere Sotterranee”](#) of [Società Italiana Gallerie \(SIG\)](#).

2019-2022 – [Delegate of the Rector](#) for the Library and the Museum network, University of Molise

2023-2025 – Member of the [CRUI Open Science Observatory 2023-2025](#)

2020-now – Coordinator of the Quality Management Unit of the M.Sc. Course in Civil Engineering, University of Molise

2015-2020 - Coordinator of the “Engineering Division” at DiBT Department, University of Molise.

2017-2019 - Coordinator of the “Commission for the structural and energetic efficiency”, University of Molise.

2017-2019 - Member of the Scientific Committee of the Research Center for “Internal Areas and the Apennines” (ArIA),

University of Molise.

2015-2019 - Member of the “Spin-off and Start-up” Committee of the University of Molise.

2015-2020 - Member of the Restricted Committee of DiBT Department, University of Molise.

2006-2019, 1999-2004 - Member of Structural and Geotechnical PhD Committee at University of Rome “Tor Vergata”.

2018-now - Member of the [Scientific Committee](#) of the WOS-ESCI indexed Journal "Gallerie e Grandi Opere Sotterranee" of the [Italian Society of Tunnels \(SIG\)](#).
 2004- now - Member of n. 12 PhD dissertation Committees in Italy (6), France (5) and Germany (1).
 2017- Member of the Jury Committee for the ["6th Best Master Dissertation Prize of the Italian Tunneling Society \(SIG\)"](#).
 2008-11 - Member of Italian Technical Committee of World Road Association (PIARC) "Safety of road tunnels".
 2010 - Member of the Committee for professional registration exams (civil and environmental engineering), University of Molise.

Visiting Professorships

[2022,2019,2018,2017,2016,2015,2014,2012,2010 - n. 9 at the Ecole Centrale Lyon \(one month for each year\)](#)
[2022 Ecole Normale Supérieure Paris-Saclay, France \(3 weeks\)](#)

2010 - University of California at Berkeley (funded by PRIN MIUR, 20 days).

1999 - University of California at Berkeley (funded by CNR "Short-term mobility", one month).

Professional registration

1993 – Professional Engineering Registration (specialization in Civil Engineering) issued by the National Council of Engineers (CNI, under the jurisdiction of the Ministry of Justice).

2. Teaching and mentoring

At *University of Molise*: professor of "**Rational Mechanics**" (since 2019, 6 credits, B.Sc.), "**Statics**" (since 2006, 6 credits, B.Sc.), "**Continuum and structural mechanics**" (since 2006, 12 credits, B.Sc.), "**Tunnels**" (since 2014, 6 credits, M.Sc.) and "**Fundamentals of Continuum Dynamics**" (2008-2013, 6 credits, M.Sc.).

At *University of Rome "Tor Vergata"*: professor of "**Tunnels**" (since 2001, 9-10 credits, M.Sc.) and of "**Mechanics of porous media**" (2000-2007, 5 credits, M.Sc.).

In charge of the teaching module "Scienze, Tecniche e Tecnologie del Paesaggio" of the **second level Master** in "[Progettazione e promozione del paesaggio culturale](#)", University of Molise 2017-2018.

The **evaluations** of these courses by the students are characterized by **excellent grades**.

Supervisor of more than **50 dissertations** (10 BSc, 35 MSc, 6 PhD) regarding topics of computational geomechanics, mechanics of porous media, as well as the analysis of major civil works, such as dams and tunnels.

International supervising:

- **École Normale Supérieure, Paris Saclay** : 1 PhD in **co-tutorship** with University of Molise (with Fabrice Gatuingt, Cedric Giry and Giuseppe Rastiello)
- **École Nationale des Ponts et Chaussées**: 2 MSc thesis in **double degree** programs with Rome "Tor Vergata";
- **Université J. Fourier, Grenoble, Laboratoire 3SR**: 1 PhD (with Cristian Dascalu and Denis Caillerie, supported by a Vinci Project) and 2 MSc thesis in **co-tutorship** with Rome "Tor Vergata";
- **Ecole Centrale Lyon, Laboratoire LTDS**: supervision of 2 PhD (one in **co-tutorship** with Rome "Tor Vergata", with Francesco Froio, supported by a Vinci Project);
- **University of Ruhr at Bochum**: 1 PhD supervision (with Günther Meschke).

3. Research

Topics of **computational geomechanics** and **mechanics of multiphase porous media**, with a focus on **failure** in geomaterials and applications to major **civil works (dams, levees, tunnels)**:

- a) Analysis and numerical simulation of **strain localization** in **multiphase porous media** by means of finite elements with **embedded strong discontinuities**, in the range of infinitesimal and finite deformations.
- b) **Multi-phase** porous media: **thermodynamic** treatment and **numerical** formulations, including the modeling of **internal erosion, double-porosity media, interface and continuum damage**.
- c) Conventional and mechanized **tunnelling**: modeling and numerical back-analysis of **monitored response** to excavation above and **below the groundwater table**, in presence of **strain localization** and **coupling** with fluid flow; interpretation of monitoring data and control of mechanized **excavation** in urban environment; modeling of **reinforcement techniques**. Simulation of **smoke propagation** by means of **computational fluid dynamics** and evacuation modeling for the **analysis of tunnel safety**.

- d) Embankment and concrete **dams and levees**: advanced computational modeling of **internal erosion** in embankment dams and levees; analysis and numerical interpretation of observed **long-term** behaviour in presence of **interaction with foundation rock/soil mass** and of **coupling with interstitial fluid flow**; **embankment and dry-stone masonry dams with impervious facing**; numerical analysis of **seismic interaction** among **concrete dam, foundation rock mass and reservoir water** (deterministic and **probabilistic methods for seismic risk** assessment).
- e) **Assessment of leakage through hydrocarbon wells**. Innovative application of poroelastic damage interface laws.
- f) **Elasto-plastic** modeling of clays in the range of **finite deformations**: theoretical and computational aspects.

3.1. Research projects

- 2021-22 – Research cooperation among [BRGM \(Service Géologique National de France\)](#), [Ecole Centrale Lyon](#) and [University of Molise](#) finalized to the **“Preliminary study of the debris flow of la Ravine de l’Eglise at Grand Ilet, in la Réunion island, employing the best available numerical tools”**.
- 2021-23 – Convention for providing scientific and technical support to "The preparation of guidelines for **Italferr S.p.A.** to study the **evolution of instability phenomena interfering with the railway infrastructure**, by identifying design solutions, as homogeneous as possible throughout Italy, for the **mitigation of the hydro-geological risks”**.
- 2017-now – Project **DPC/ReLUIS**. Leader of Unimol Research Unit of “Territorial research (CARTIS) - Development of a methodology for the **assessment of seismic exposure and vulnerability at territorial scale**, based on typological and structural characteristics of residential buildings”
- 2016-now - Principal investigator of the Project on **"Seismic and hydro-geological risk** in Apennine areas: assessment methods and mitigation strategies", Research Center for internal areas and Apennines, University of Molise.
- 2016-now – Principal investigator of the Department Project on "Computational modeling of **erosion** effects on dams, levees, and historic artefacts", DiBT, University of Molise.
- 2015-18 - MIUR-DiBT "Research Funds" - P.I. of the Engineering Division Project "Characterization of **urbanized environments** and definition of **regenerating strategies**", DiBT, University of Molise.
- 2013-16 – PRIN 2010-11, leader of Research Unit on: “Cleaner energy systems based on underground CO₂ storage, with a focus on long-term **assessment of carbon leakage through existing wells**” (P.I.: F. Auricchio).
- 2012-13 - German-Italian University Centre, “Vigoni” exchange grant with Ruhr University Bochum on “Advanced computational modelling of **shear failure in tunnelling**”, leader of Italian Research Unit.
- 2012-13 - Projet 2012 LTDS (Laboratoire de Tribologie et Dynamique des Systèmes, UMR5513) “Modélisation de la propagation du front **d'érosion interne** dans les barrages : validation d'une loi d'endommagement par simulations numériques discrètes” in cooperation with Ecole Centrale Lyon and ENTPE Lyon.
- 2012 - Projet 2012 VOR (Structure fédérative de recherche : Vulnérabilité des Ouvrages aux Risques) “Innovative numerical methods for the assessment of **internal erosion risk** in embankment dams and levees” in cooperation with Ecole Centrale Lyon.
- 2007-08 - PRIN 2007, leader of Research Unit on: “Numerical simulation methods and geographic information systems for management of **dam-foundation** structural safety” (P.I. G. Novati).
- 2006 - “Progetto di ricerca di Ateneo (ex 60%)”, University of Rome “Tor Vergata”, “**Tunnels** below the groundwater table: numerical predictions of subsidence and effects on water resources” leader of Research Unit.
- 2004-05 - PRIN 2004, leader of Research Unit on: “Hydro-mechanical interaction between **dam and foundation**: analysis, numerical simulation and interpretation of monitoring data” (P.I. G. Maier);
- 2002-03 - PRIN 2002, member of Research Unit on: “Analysis of crack propagation in **dams**: material modeling, hydraulic fracture simulation and finite element implementation” (P.I. G. Maier);
- 2002 - “Progetto di ricerca di Ateneo (ex 60%)”, University of Rome “Tor Vergata”, “Effects of strain localization on **tunneling-induced subsidence**” member of Research Unit.
- 2001 - “Young Researcher Project”, University of Rome “Tor Vergata”, “Formulation of a finite element method for **strain localization analysis in saturated porous media**”, leader of Research Unit.
- 2000 - “Young Researcher Project”, University of Rome “Tor Vergata”, “Theoretical analysis and numerical simulation of **strain localization** in geomaterials”, leader of Research Unit.
- 1999-2001 – Three cooperation research grants of the **Italian Dam Agency** (participant):

- “Embankment dams with bituminous concrete facing” (1999);
- “Leakage in embankment dams with clay core” (2000);
- “Leakage in concrete dams” (2001);

3.2. Participation and cooperation with international research groups

2016-now - Member of **GDRI GeoMech** (international group INSIS - CNRS) "Multi-Physics and Multi-Scale Couplings in Geo-Environmental Mechanics".

2012-now - Cooperation with **Research Center SFB 837** “Interaction Modelling in Mechanized Tunneling” coordinated by Günther Meschke, **Ruhr University at Bochum** (advanced computational modeling of strain localization and of tunnel face stability).

2012-now – Cooperation with Francesco **Froio (EC Lyon)** (modeling of internal erosion)

1999-now - Member of **Laboratoire Lagrange** (French-Italian Research group CNR-CNRS).

1997-2010 – Cooperation with Francisco **Armero, University of California at Berkeley** (strain localization in porous media).

3.3. Organization of Conferences, Symposia and Special Issues

2022 – Coordinator of the Scientific Committee of the “Conference on [The role of underground infrastructures in the achievement of the U.N. Sustainable Development Goals](#)” SAIE Bologna, October 20–21, 2022

2022-2023 – Member of the [Scientific Committee of the WTC2023 ITA-AITES General Assembly and World Tunnel Congress, Athens](#).

2021-now - Co-Organizer (with D. Sterpi, Politecnico Milano) of a Special Issue on “[Innovative numerical methods for internal erosion processes](#)” in “[Geomechanics for Energy and the Environment](#)” Journal.

2020 – Co-Organizer (with D. Sterpi, Politecnico Milano) of the a workshop “[Innovative numerical methods for internal erosion processes](#)” proposed for the 2020 online meeting of the European Working Group on Internal Erosion (EWG-IE), 17 dicembre 2020.

2020-2022– Member of the [Scientific Committee](#) of the ECCOMAS Thematic Conference “[EURO:TUN 2022](#)”, Ruhr University Bochum, Germany, October 27-29, 2021.

2020-2022 – Co-Organizer (with A. Alsahly, Rhur University at Bochum) of the Invited Symposium “[Model based analysis of stability of tunnels and other underground openings](#)” at “[EURO:TUN 2022](#)”, 5th thematic ECCOMAS Conference on Computational Methods in Tunneling and Subsurface Engineering.

2018-2022 – Member of the Local Organizing Committee of “[16th International Conference of the International Association for Computer Methods and Advances in Geomechanics \(IACMAG 2020\)](#)”, Torino, Italy 2021.

2020 – Co-organizer (with S. Bonelli and F. Froio) of “[MS132 - Computational Modelling of Internal Erosion](#)”, [14th World Congress in Computational Mechanics and ECCOMAS Congress 2020](#), Paris, July 19-24 2020.

2020 – Member of the Scientific Committee of the “[28th Annual Meeting of European Working Group on Internal Erosion in Embankment Dams, Levees and Dikes, and their Foundations \(EWG-IE\)](#)” 7-10 July 2020 –Sheffield, UK.

2018 – Member of the Scientific Committee of the “[26th Annual Meeting of European Working Group on Internal Erosion in Embankment Dams, Levees and Dikes, and their Foundations \(EWG-IE\)](#)” 10-13 September 2018 –Milano, Italy.

2017-2018 – Member of the International Organizing Committee and of the International Scientific Advisory Committee of the [9th International Conference for Computation Methods \(ICCM2018\)](#), Rome, August 6th –10th, 2018.

2017-2019 – Member of the [Scientific Committee of the WTC2019 ITA-AITES General Assembly and World Tunnel Congress](#), Naples.

2015-2017– Member of the Scientific Committee of the ECCOMAS Thematic Conference “[EURO:TUN 2017](#)”, Innsbruck.

2017 – Invited Symposium “[Numerical assessment of the stability of tunnels and other underground openings](#)” at [EURO:TUN 2017](#), 4th thematic ECCOMAS Conference on Computational Methods in Tunneling and Subsurface Engineering.

2013 - Invited Symposium “[Computational failure analysis in subsurface engineering](#)” at [EURO:TUN 2013](#), 3rd thematic ECCOMAS Conference on Computational Methods in Tunneling and Subsurface Engineering.

2009 - Invited Symposium “[Numerical simulation of tunnel failure](#)” at EURO:TUN 2009, 2nd ECCOMAS thematic Conference on Computational Methods in Tunneling.

2007 - Special Session: “Simulation of multifield and multiscale problems in structural and material engineering” at 6th EUROSIM Congress, 9-13 Sept., Ljubljana, Slovenia.

2002 - “Colloque Lagrange Géotechnique”, Ecole Nationale des Ponts et Chaussées ([contributions published in Volume 31, Issue 3 of “Computers and Geotechnics” journal](#));

3.4. Member of PhD dissertation Committees and PhD admission Committees

- 2018 - PhD dissertation Committee in "Structural, Seismic and Geotechnical Engineering" **Politecnico Milano**, Italy
- 2018 - PhD dissertation Committee in "Matériaux, Mécanique, Génie civil, Electrochimie", Université de **Grenoble (L3S)**, France.
- 2018 - PhD dissertation Committee in “Architecture e Construction” **University of Rome “Tor Vergata”**.
- 2018 - PhD dissertation Committee in co-tutorship: “Structural and geotechnical engineering” (**University of Rome “Tor Vergata”**) and “Mécanique, Génie Civil” (**Ecole Centrale de Lyon**).
- 2017 - PhD dissertation Committee in “Structural Mechanics”, **Ruhr University at Bochum**, Germany
- 2016 - PhD dissertation Committee in “Mécanique, Génie Civil”, **Ecole Centrale de Lyon**, France.
- 2016 - PhD dissertation Committee in “Computational Mechanics and Advanced Materials”, **IUSS-Scuola Universitaria Superiore, Pavia**, Italy
- 2016 - Committee for admission to the PhD in “Civil Engineering and Architecture”, University of **Pavia**, Italy.
- 2015 - PhD dissertation Committee in “Mécanique des fluides”, **Ecole Centrale de Lyon**, France.
- 2012 - PhD dissertation Committee in “Matériaux, Mécanique, Génie civil, Electrochimie”, Université de **Grenoble (L3S)**, France.
- 2012 - PhD dissertation Committee in “Structural engineering”, University of **Catania**, Italy
- 2011 - PhD dissertation Committee in “Matériaux, Mécanique, Génie civil, Electrochimie”, Université de **Grenoble (L3S)**, France.
- 2010 - PhD dissertation Committee in “Material and structural engineering”, University of **Calabria**, Italy.
- 2004 - Committee for admission to the PhD in “Structural and geotechnical engineering”, University of **Rome “Tor Vergata”**, Italy.

3.5. Chairman of sessions (besides those at sect. 3.3)

- 2018 – Chairman of the session “Multi-scale/mesoscale Modeling of Granular Materials Based on Discrete or Coupled Discrete-Continuum Methods” of [9th International Conference for Computation Methods \(ICCM2018\)](#), Rome, August 6th –10th, 2018.
- 2015 – Chairman of a session of *Colloque Lagrange 2015*, ENSTA ParisTech, Palaiseau
- 2014 – Chairman of session “Failure of Geomaterials” of the *14th Conf. of International Association for Computer Methods and Advances in Geomechanics (14th IACMAG)*, Kyoto.
- 2010 – Chairman of a session of the *XVIII Conference of the Italian Group of Computational Mechanics (GIMC)*, Siracusa.
- 2007 – Chairman of a session of the symposium “Numerical Techniques for the Modeling of Failure in Solids” at the *9th United States National Congress on Computational Mechanics (USNCCM-9)*, San Francisco.
- 2004 – Chairman of session “Constitutive relations: verification and validation” of the *9th International Symposium on Numerical Models in Geomechanics (NUMOG IX)*, Ottawa.
- 2002 – Chairman of a session of the *Colloque Lagrange Geotechnique*, Ecole Nationale des Ponts et Chaussées, Paris.

3.6. Public engagement

- 2017 - **Seismic vulnerability** assessment of 13 existing **school buildings** in Molise.

3.7. Reviewer of papers and project proposals. Monitoring of research projects

- Reviewer of **proposals of research projects** for MIUR (Italian Research Ministry), University of Nottingham, University of Rome "La Sapienza".
- **Monitoring and final assessment** of "FutureInResearch"(FIR) projects.
- Reviewer of **papers** for ANVUR (National Agency for the Evaluation of Universities and Research Institutes)
- Reviewer of **papers** for the following international **journals**:

1) Computer Methods in Applied Mechanics and Engineering	15) Structure and Infrastructure Engineering
2) International J. for Numerical Methods in Engineering	16) Engineering Geology
3) Mechanics of Materials	17) European Journal of Mechanics – A/Solids
4) Géotechnique	18) International Journal of Solids and Structures
5) Int. J. for Numerical and Analytical Methods in Geomechanics	19) Rock Mechanics and Rock Engineering
6) Advances in water resources	20) Wave Motion
7) Applied mathematical modelling	21) Meccanica
8) ASCE J. of Geotechnical and Geoenvironmental Engrng.	22) Soils and Foundations
9) CMES: Computer Modeling in Engineering & Sciences	23) Eur. J. of Environ. and Civil Engineering
10) Computers and Geotechnics	24) Earthquake Engineering and Eng. Vibration
11) Computers and Structures	25) Annals of Solid and Structural Mechanics
12) Tunnels and Major Underground Works	26) Journal of Porous Media
13) Tunnelling and Underground Space Technology	27) Simulation Modelling Practice and Theory
14) Nuclear Engineering and Design	28) Journal of Zhejiang University-SCIENCE A
	29) Springerplus

4. List of publications

Journal papers with IF

- [1] Callari C. and Sterpi D. (2022), Editorial for the Special Issue: “Innovative numerical methods for soil internal erosion processes”, *Geomechanics for Energy and the Environment*, 2022, 100414, <https://doi.org/10.1016/j.gete.2022.100414>
- [2] Callari C., Pol J.C. (2022). Numerical interpretation of regressive localized internal erosion in a real-scale levee physical model. *Geomechanics for Energy and the Environment*, 100395. <https://doi.org/10.1016/j.gete.2022.100395>
- [3] Callari C. and Froiio F. (2020) [A hydro-mechanical finite element formulation for localized internal erosion in porous media, with application to backward piping in cofferdams](#), *International Journal for Multiscale Computational Engineering*, 18(2):181–197, <https://doi.org/10.1615/IntJMultCompEng.2020031422>.
- [4] Froiio F., Callari C., Rotunno A. (2019) [A numerical experiment of backward erosion piping: kinematics and micromechanics](#), *Meccanica*, 54(14), 2099–2117, <https://doi.org/10.1007/s11012-019-01071-7>.
- [5] Rotunno A., Callari C., Froiio F. (2019) [A finite element method for localized erosion in porous media with applications to backward piping in levees](#), *International Journal of Numerical and Analytical Methods in Geomechanics*, 2019;43:293–316, <https://doi.org/10.1002/nag.2864>
- [6] Morganti S., Callari C., Auricchio F., Reali A. (2018) [Mixed isogeometric collocation methods for the simulation of poromechanics problems in 1D](#), *Meccanica*, April 2018, Volume 53, Issue 6, pp 1441–1454, <https://doi.org/10.1007/s11012-018-0820-8>
- [7] Alsahly A., Callari C. and Meschke G. (2018), [An algorithm based on incompatible modes for the global tracking of strong discontinuities in shear localization analyses](#), *Computer Methods in Applied Mechanics and Engineering*, 330, 33–63 <https://doi.org/10.1016/j.cma.2017.10.014>
- [8] Tran, D.K., Prime, N., Froiio, F., Callari, C., Vincens, E. (2017) [Numerical modelling of backward front propagation in piping erosion by DEM-LBM coupling](#), *European Journal of Environmental and Civil Engineering*, 21 (7-8), 960–987, <http://www.tandfonline.com/doi/full/10.1080/19648189.2016.1248794>
- [9] Abati, A. and Callari, C. (2014), [Finite element formulation of unilateral boundary conditions for unsaturated flow in porous continua](#), *Water Resources Research*, 50 (6), 5114–5130. <http://dx.doi.org/10.1002/2013WR014693>
- [10] Lupoi, A. and Callari, C. (2012), [A probabilistic method for the seismic assessment of existing concrete gravity dams](#), *Structure and Infrastructure Engineering*, 8(10), 985–998. <http://dx.doi.org/10.1080/15732479.2011.574819>
- [11] Callari, C., Abati, A. (2011), [Hyperelastic multiphase porous media with strain-dependent retention laws](#), *Transport in Porous Media*, 86, 1, 155–176. <http://dx.doi.org/10.1007/s11242-010-9614-8>
- [12] Callari, C., Armero F., Abati, A. (2010), [Strong discontinuities in partially-saturated poroplastic solids](#), *Computer Methods in Applied Mechanics and Engineering*, 199, 1513–1535. <http://dx.doi.org/10.1016/j.cma.2010.01.002>
- [13] Callari, C., Abati, A. (2009), [Finite element methods for unsaturated porous solids and their application to dam engineering problems](#), *Computers and Structures*, 87, 485–501. <http://dx.doi.org/10.1016/j.compstruc.2008.12.012>
- [14] Callari C. (2004), [Coupled numerical analysis of strain localization induced by shallow tunnels in saturated soils](#), *Computers and Geotechnics*, vol. 31, 3, 193–207. <http://dx.doi.org/10.1016/j.compgeo.2004.01.004>
- [15] Callari, C. and Armero, F. (2004), [Analysis and numerical simulation of strong discontinuities in finite strain poroplasticity](#), *Computer Methods in Applied Mechanics and Engineering*, 193, 27–29, 2941–2986. <http://dx.doi.org/10.1016/j.cma.2004.02.002>
- [16] Callari, C. and Armero, F. (2002), [Finite Element Methods for the Analysis of Strong Discontinuities in Coupled Poroplastic Media](#), *Computer Methods in Applied Mechanics and Engineering*, vol. 191, 39–40, 4371–4400. [http://dx.doi.org/10.1016/S0045-7825\(02\)00374-2](http://dx.doi.org/10.1016/S0045-7825(02)00374-2)
- [17] Callari, C. and Federico, F. (2000), [FEM validation of a double-porosity elastic model for consolidation of structurally complex clayey soils](#), *International Journal of Numerical and Analytical Methods in Geomechanics*, vol. 24, 4, p. 367–402. [http://dx.doi.org/10.1016/S0749-6419\(98\)00050-3](http://dx.doi.org/10.1016/S0749-6419(98)00050-3)
- [18] Armero, F. and Callari, C. (1999), [An Analysis of Strong Discontinuities in a Saturated Poro-Plastic Solid](#), *International Journal of Numerical Methods in Engineering*, vol. 46, 10, 1673–1698. [http://dx.doi.org/10.1002/\(SICI\)1097-0207\(19991210\)46:10<1673::AID-NME719>3.0.CO;2-S](http://dx.doi.org/10.1002/(SICI)1097-0207(19991210)46:10<1673::AID-NME719>3.0.CO;2-S)
- [19] Callari, C., Auricchio, F., Sacco, E. (1998), [A finite-strain Cam-clay model in the framework of multiplicative elasto-plasticity](#), *International Journal of Plasticity*, 14(12), 1155–1187. [http://dx.doi.org/10.1016/S0749-6419\(98\)00050-3](http://dx.doi.org/10.1016/S0749-6419(98)00050-3)

Chapters in books and papers in journals and conference proceedings (INDEXED IN SCOPUS AND/OR WOS)

- [20] di Prisco C., Boldini D., Desideri A., Bilotta E., Russo G., Callari C., Flessati L., Graziani A., Meda A. [2022]. Chapter 9: Computational methods, in: *Handbook on Tunnels and Underground Works: Volume 1: Concept – Basic Principles of Design (1st ed.)*. CRC Press, pp. 203-245, <https://doi.org/10.1201/9781003256175>.
- [21] di Prisco C., Callari C., Barbero M., Bilotta E., Russo G., Boldini D., Desideri A., Flessati L., Graziani A., Luciani A., Meda A., Pescara M., Plizzari G., Tiberti G., Sciotti A. [2022], Chapter 10: Assessment of excavation-related hazards and design of mitigation measures, in: *Handbook on Tunnels and Underground Works: Volume 1: Concept – Basic Principles of Design (1st ed.)*. CRC Press, pp. 247-316, <https://doi.org/10.1201/9781003256175>
- [22] Callari C. (2021), [Assessment of Tunnel Stability: Safety Factors and Numerical Techniques](#). In: Barla M., Di Donna A., Sterpi D. (eds) *Challenges and Innovations in Geomechanics*. IACMAG 2021. Lecture Notes in Civil Engineering, vol 126. pp 12-20, Springer, Cham. https://doi.org/10.1007/978-3-030-64518-2_2
- [23] Callari C. and Pelizza S. (2020), [The role of 19th-century tunnelling engineering in binding Italy to Europe and bridging the gap between the north and south of a new state](#), 135-136, pp. 19-33, *Gallerie e Grandi Opere Sotterranee*, 2020.
- [24] Callari C. (2019) [The outlets of the Albano and Fucine Lakes and their influence from Roman times up to the birth of modern tunnel engineering](#), *Tunnels and Underground Cities. Engineering and Innovation Meet Archaeology, Architecture and Art*: Proceedings of the WTC 2019 ITA-AITES World Tunnel Congress (WTC 2019), May 3-9, 2019, Naples, Italy
- [25] Rotunno AF, Callari C, Froio F. (2019) [A numerical approach for the analysis of piping erosion in hydraulic works](#). In: Bonelli S, Jommi C, Sterpi D, eds. *Internal Erosion in Earthdams, Dikes and Levees: Proceedings of EWG-IE 26th Annual Meeting 2018*, Lecture Notes in Civil Engineering, vol. 17. Switzerland: Springer Nature Switzerland; 2019:159-167. https://doi.org/10.1007/978-3-319-99423-9_15
- [26] Rotunno A.F., Callari C., Froio F. (2017) [Computational Modeling of Backward Erosion Piping, Models, Simulation, and Experimental Issues in Structural Mechanics](#), Michel Frémond et al. (Eds.), Series Solid, Structural Mechanics, Vol. 8, Springer, 2017.
- [27] Tran, D.K., Prime, N., Froio, F., Callari, C., Vincens, E. (2017), Discrete modelling of front propagation in backward piping erosion, *8th Int. Conf. on Micromechanics of Granular Media (Powders and Grains)*, Montpellier, 2017.
- [28] Callari, C. (2015) [Numerical assessment of tunnel face stability below the water table](#), *Computer Methods and Recent Advances in Geomechanics*, Oka, Murakami, Uzuoka & Kimoto (Eds.), 2007-2010, Taylor & Francis Group, London, 2015.
- [29] Callari C., Casini S. (2006), [Three-dimensional analysis of shallow tunnels in saturated soft ground](#), *Geotechnical Aspects of Underground Construction in Soft Ground - Fifth Int. Symp. TC28*, 2006, Balkema, 495-501.
- [30] Callari C., Casini S. (2005), [Tunnels in saturated elasto-plastic soils: three-dimensional validation of a plane simulation procedure](#), *Mechanical Modelling and Computational Issues in Civil Engineering*, M. Frémond & F. Maceri (Eds.), Springer, 2005, 143-164.
- [31] Armero, F. and Callari, C. (2004), On the Modeling of Localized Failures in Saturated Porous Media through Strong Discontinuities, *Computational Mechanics, WCCM VI*, Z.H. Yao et al., eds., Sept. 5-10, 2004, Beijing, China, 2004, Tsinghua University Press & Springer-Verlag, 193-198, CD 1C.
- [32] Callari, C. e Lupoi, A. (2004), [Localization Analysis in Dilatant Elasto-Plastic Solids by a Strong-Discontinuity Method](#), *Novel approaches in civil engineering*, M. Frémond & F. Maceri (Eds.), Springer-Verlag, 2004, 121-132. http://dx.doi.org/10.1007/978-3-540-45287-4_8
- [33] Callari, C. Jappelli, R. and Raggi, F. (2004), [Coupled finite element analysis of the construction of a large Italian embankment dam founded on stiff clay](#), *Numerical Models in Geomechanics – NUMOG IX*, G.N. Pande & S. Pietruszczak, eds., Balkema, Rotterdam, 615-622.
- [34] Callari, C. (2002), [The application of a strong-discontinuity FEM to the analysis of strain localization induced by underground openings](#), in: G.N. Pande & S. Pietruszczak, eds., *Numerical Models in Geomechanics – NUMOG VIII*, Balkema, Rotterdam, 163-170.
- [35] Callari, C., Auricchio, F., Sacco, E. (1997), [Finite-element implementation of a finite-strain Cam-clay model](#), *Computational Plasticity: Fundamentals and Applications*, edited by D. R. J. Owen, E. Oñate and E. Hinton, 2, 1649-1656, CIMNE, Barcelona.

- [36] Federico, F. & Callari, C. (1995), Representativeness of a double porosity model for the consolidation appraisal of highly fissured clayey soils, *Int. Symp. on Compression and Consolidation of Clayey Soils*, edited by H. Yoshikuni & O. Kusakabe, I, 307-314, Balkema, Rotterdam.

Chapters in books and articles in conference proceedings (not indexed in Scopus or WoS)

- [37] Mancini, M., Colamaio, P., Gioia, P., Albino, G. e Callari, C. (2022) L'ipogeo artificiale del Fosso Rava nel comune di Pesche in provincia di Isernia (Molise). Considerazioni preliminari relative ad un corso d'acqua tombato, tra espansione urbanistica, cementificazione e rischio idraulico, *Opera Ipogea* 1/2022, pp. 25-38.
- [38] Alsahly A., Callari C. and Meschke G. (2017), Investigation of Computational Approaches for the Assessment of Tunnel Face Stability. *4th ECCOMAS Conf. on Computational Methods in Tunneling and Subsurface Engineering (EURO:TUN 2017)*, Innsbruck, April 2017.
- [39] Callari C., Alsahly A. and Meschke G. (2017), Assessment of stand-up time and advancement rate effects for tunnel faces below the water table. *4th ECCOMAS Conf. on Computational Methods in Tunneling and Subsurface Engineering (EURO:TUN 2017)*, Innsbruck, April 2017.
- [40] Callari, C., Fasano, V. (2014), Analisi del danneggiamento di pozzi esistenti in siti di stoccaggio di CO₂. Conference "Problemi attuali e prospettive nell'ingegneria delle strutture", Maratea, 26-27 settembre 2013, 239-244, Pellegrini Editore, Cosenza, 2014.
- [41] Callari, C., Fasano, V. (2013), Damage analysis for wells in CO₂ storage sites. In: *EURO:TUN 2013, Computational Methods in Tunnelling and Subsurface Engineering*, Meschke G., Eberhardsteiner J., Schanz T., Soga K., Thewes M., (Eds.), 437-448, Aedificatio Publishers, 2013.
- [42] Gemelli F., C. Dascalu, D. Caillerie, C. Callari (2011), [Modélisation de l'endommagement pour les milieux poreux saturés: une approche multi-échelle](#), *20ème Congrès Français de Mécanique*, Besançon.
- [43] Lupoi, A. and Callari, C. (2011), The role of probabilistic methods in evaluating the seismic risk of concrete dams, Ch. 15 in: *Protection of built environment against earthquakes*, Dolšek Matjaž (Ed.), Springer.
- [44] Callari, C. (2009), Three-dimensional effects of ground desaturation due to tunneling. In: *Computational Methods in Tunneling-EURO:TUN 2009*, G. Meschke, G. Beer, J. Eberhardsteiner, D. Hartmann, M. Thewes (Eds.), pp. 517-524, Aedificatio Publishers, 2009
- [45] Callari, C. (2009), Effects of Strain Localization on Tunnel Stability and Induced Subsidence. In: *Computational Methods in Tunneling-EURO:TUN 2009*, G. Meschke, G. Beer, J. Eberhardsteiner, D. Hartmann, M. Thewes (Eds.), pp. 793-800, Aedificatio Publishers, 2009
- [46] Lupoi A. and C. Callari (2010), Probabilistic seismic assessment of concrete dams, *Safety, Reliability and Risk of Structures, Infrastructures and Engineering Systems*, Furuta, Frangopol & Shinozuka (eds), pp. 1758-1765, Taylor & Francis Group, London.
- [47] Callari, C. (2009), [Three-dimensional interaction between concrete gravity dam and foundation rock mass in presence of coupling with seepage](#). In: *Long term behaviour of dams (LTBD09)*, 12-13 October 2009, pp. 443-449, Verlag der Technischen Universität Graz, Graz.
- [48] Callari, C. and Armero, F. (2005), Nonlinear Geometric Effects on the Localized Failure of Poroplastic Solids, *3rd International Conference on Structural Stability and Dynamics*, Kissimmee, Florida.
- [49] Callari C., Jappelli R. (2004), [Comportamento a breve e a lungo termine della diga di Monte Cotugno sul fiume Sinni](#), *XXII Convegno Nazionale di Geotecnica "Valutazione delle condizioni di sicurezza e adeguamento delle opere esistenti"*, Palermo, 22-24 September 2004, Pàtron Editore, Bologna, 469-477.
- [50] Di Maio S., Callari C., (2004), [Comportamento delle dighe di calcestruzzo e di rockfill costituenti lo sbarramento dell'Ingagna](#), *XXII Convegno Nazionale di Geotecnica "Valutazione delle condizioni di sicurezza e adeguamento delle opere esistenti"*, Palermo, 22-24 September 2004, Pàtron Editore, Bologna, 497-505.
- [51] Callari, N. Fois, R. Cicivelli (2004), [The role of hydro-mechanical coupling in the behaviour of dam-foundation system](#), *Computational Mechanics, WCCM VI in conjunction with APCOM'04*, Sept. 5-10, 2004, Beijing, China, 2004, Tsinghua University Press & Springer-Verlag, I, 411 (abstract), CD 1.
- [52] Callari, C. e Marchetti, P. (2003), Analisi di gallerie con il metodo convergenza-confinamento, *Manuale di Ingegneria Civile e Ambientale*, vol. 1, quarta edizione, Zanichelli/Esac.
- [53] Callari, C. (2002), [Analisi di gallerie superficiali con un metodo agli elementi finiti non convenzionale](#), *XXI Convegno Nazionale di Geotecnica "Opere geotecniche in ambiente urbano"*, L'Aquila, 11-13 September 2002, Pàtron Editore, Bologna, 495-502.

- [54] Lupoi, G., Callari, C. and Lupoi, A. (1999), [Aspetti geotecnici nel progetto dell'ospedale sismicamente isolato di Frosinone](#), *Workshop on Seismic Design and Retrofitting of Hospitals in Seismic Areas*, Firenze.
- [55] Lupoi, G., Lupoi, A., Callari, C. (1999), [Structural design for the new seismic isolated hospital of Frosinone](#), *Workshop on Seismic Design and Retrofitting of Hospitals in Seismic Areas*, Firenze.
- [56] Jappelli R., Bertacchi P., Callari C., Cazzuffi D., Di Maio S., Sarti L., Sembenelli P. (1999), [Embankment Dams with Bituminous Concrete Upstream Facing: Review and Recommendations](#), International Commission on Large Dams (ICOLD) Bulletin n. 114.
- [57] Armero, F. and Callari, C. (1998), Strong Discontinuities in Fully Saturated Porous Media, *Computational Mechanics, Proc. IV WCCM*, ed. by S. Idelsohn, E. Onate and E. Dvorkin, Buenos Aires, 1998.
- [58] Callari, C., Auricchio, F., Sacco, E. (1996), A return-map algorithm for a finite-strain Cam-clay plasticity model, *Joint Conf. of Italian Group of Comp. Mech. and Ibero-Latin American Association of Comp. Meth. in Eng.*, 61-64, Padova.
- [59] Federico, F. e Callari, C. (1996), Computer simulation of the mechanical response of structurally complex clayey soils, *Conf. of Italian Society for Computer Simulation*, 170-175, Roma.
- [60] Callari, C. (1994), FEM validation of a double porosity model for consolidation analysis, *8th European Young Geotechnical Engineers Conference*, edited by J. Fedà, 11-14, Starà Lesná, Slovak Republic.

Other publications, including research reports, PhD Thesis, communications

- [61] Gemelli F., C. Dascalu, D. Caillerie, C. Callari (2013), Multi-scale modeling of damage in porous media by asymptotic homogenization, *EUROMECH Colloquium 548, "Direct and variational methods for nonsmooth problems in mechanics"*, Amboise, France 24-26 June 2013.
- [62] Gemelli F., Caillerie D., Callari C., Dascalu C. (2010), Hydro-Mechanical Damage and Deferred Behaviour of the Geomaterials: a Homogenization Approach, *Journée des Thèses 2010, Laboratoire 3S-R*, June 2010.
- [63] Callari, C., Abati, A. (2007) Macroscopic thermodynamics of coupled unsaturated porous continua. Report SAVA/ICAR-08-UM 11/2007, Università del Molise.
- [64] Callari C. and Armero F. (2004), [Localizzazione in mezzi saturi soggetti a grandi deformazioni](#), *Incontro Annuale dei Ricercatori di Geotecnica (IARG 2004)*, Trento.
- [65] Callari, C. e Marchetti, P. (2003), Analisi di gallerie con il metodo convergenza-confinamento, *Manuale di Ingegneria Civile e Ambientale*, vol. 1, quarta edizione, Zanichelli/Esac.
- [66] Callari, C., Appunti dei corsi di gallerie e grandi opere sotterranee, Università di Roma "Tor Vergata", revisione 2014.
- [67] Callari, C., Appunti del corso di meccanica dei mezzi porosi, Università di Roma "Tor Vergata", revisione 2006.
- [68] Callari C. e Fois N. (2003), Analisi accoppiata dell'interazione tra diga di calcestruzzo ed ammasso roccioso di fondazione, Rapporto di Ricerca, Convenzione tra il Servizio Nazionale Dighe ed il D.I.C. Università di Roma "Tor Vergata": "Problemi di tenuta delle dighe di calcestruzzo"
- [69] Callari C. (2002), [Analisi numerica della localizzazione indotta dallo scavo di gallerie superficiali in terreni saturi](#), *Incontro Annuale dei Ricercatori di Geotecnica (IARG 2002)*, Napoli.
- [70] Jappelli, R., Callari, C., Varnero, L. (1999), Problemi di tenuta delle dighe con manti artificiali: Verifica del manto con il metodo degli elementi finiti, Rapporto di ricerca, Convenzione tra il Servizio Nazionale Dighe ed il Dipartimento di Ingegneria Civile dell'Università di Roma "Tor Vergata".
- [71] Callari, C. (1998), An elasto-plastic model for tunnels in clayey soils reinforced with a nailing technique, Research report, Dipartimento di Ingegneria Civile, Università di Roma "Tor Vergata".
- [72] Callari, C., Auricchio, F., Sacco, E. (1998) An implicit integration technique for the finite-element implementation of a finite-strain Cam-clay model, Research report, Dipartimento di Ingegneria Civile dell'Università di Roma "Tor Vergata".
- [73] Callari, C. (1997), [Modellazione elasto-plastica in deformazioni finite delle argille tenere: Aspetti teorici e computazionali](#), Tesi di Dottorato, Università di Roma Tor Vergata.
- [74] Callari, C. (1994), Teoria dello stato critico e metodo degli elementi finiti (recensione di: A.M. Britto, M.J. Gunn, Critical State Soil Mechanics via Finite Elements), *Rivista Italiana di Geotecnica*, 3, 253-254.

5. List of invited seminars

- (s1) "Assessment of fire risk for road tunnel users", Master REACT University of Molise, 8 giugno 2021.
- (s2) "Observational Method in tunneling design", II Level Master in Tunnel Engineering (2021-2022, III edition), Department of Civil and Environmental Engineering, Politecnico Milano, April 23, 2021.
- (s3) "Collaborative research on localized failure and erosion in geomaterials", [*CEA \(French Alternative Energies and Atomic Energy Commission\) - Université Paris Saclay*](#), April 9, 2019.
- (s4) "Recent collaborative research on localized phenomena in geo- and poro-mechanics problems", Columbia University, New York City, Department of Civil Engineering and Engineering Mechanics, September 2018.
- (s5) "Infrastrutture, edilizia, strutture per la mitigazione dei rischi e loro interazione con il paesaggio", Master di II livello [*"Progettazione e promozione del paesaggio culturale"*](#), Università del Molise, Campobasso, 12 dicembre, 2017.
- (s6) [*Casi rappresentativi di instabilità e di stabilizzazione di gallerie: soluzioni progettuali, tecniche esecutive e monitoraggio \(slides\)*](#), Gruppo Geotecnici a Roma, Facoltà di Ingegneria Civile e Industriale, Sapienza Università di Roma, 06 dicembre 2017.
- (s7) [*"A new algorithm for the tracking of slip surfaces in elastoplastic solids"*](#) Seminar at the Ecole Centrale de Lyon LTDS, March 30, 2017.
- (s8) [*"The collaborative research on internal erosion by ECL, UniMol and UniRoma2"*](#) Seminar at the Ecole Centrale de Lyon LTDS, April 13, 2016
- (s9) [*"Theoretical and Computational Poromechanics"*](#) a short course (5x2 hours) for the PhD in Civil Engineering and Architecture at the University of Pavia, June 22-26, 2015.
- (s10) [*"Enhanced finite elements with embedded discontinuities for the modeling of displacement and fluid-flow jumps"*](#), Lecture for the course "Recent Advances in Numerical Modeling and Simulation" of the "Computational Engineering" MSc, Institute for Structural Mechanics - Ruhr University Bochum - June 9, 2015.
- (s11) [*"The role of interface damage poromechanics in the modeling of hydrocarbon wells"*](#) Seminar at the Ecole Centrale de Lyon, April 16, 2015
- (s12) "Fires in road tunnels: risk analysis based on the modeling of smoke propagation and user evacuation", Seminar at the Ecole Centrale de Lyon, April 9, 2015
- (s13) "An introduction to tunnel design and construction", Seminar at the Ecole Centrale de Lyon, April 8, 2015
- (s14) [*"Damage in pressurized interfaces of hydrocarbon wells"*](#), Seminar at the Research Department "Subsurface Modeling and Engineering" (RD-SME) in Ruhr-University Bochum, February 17, 2015.
- (s15) [*"Danneggiamento delle interfacce di pozzi di idrocarburi in presenza di fluidi in pressione"*](#) (in cooperation with V. Fasano) Seminar at the DICII Department, University of Rome "Tor Vergata", February 12, 2015.
- (s16) [*"Risk analysis of road tunnels, with simulation of fire smoke and evacuation"*](#), Seminar at the Ecole Centrale de Lyon, May 13, 2014
- (s17) "Conventional and mechanized tunneling: from design to construction", Seminar at the Ecole Centrale de Lyon, April 23, 2014
- (s18) "La verifica del progetto e i suoi effetti sull'esecuzione. Analisi di casi reali", Corso di perfezionamento "Il responsabile unico del procedimento negli appalti di lavori pubblici", edizioni 2012 e 2013, Campobasso.
- (s19) "Computational mechanics of porous media: recent results and future developments" Dép. de Mécanique de Solides, Génie Mécanique, Génie Civil (MSGMGC), Laboratoire de Tribologie et Dynamique des Systèmes (LTDS), Lyon, May 23, 2012
- (s20) "Conventional and mechanized tunneling: design issues and observed ground response", Seminar at the Ecole Centrale de Lyon, May 22, 2012
- (s21) [*"Finite Element Modeling of Localisation Zones \(Cracks, Shear Bands\) Using the Embedded Crack Approach: Single and Multiphase Formulation"*](#), Lecture of the [*"Computational Plasticity"*](#) Course, Institute for Structural Mechanics - Department for Civil and Environmental Engineering, Ruhr University Bochum - May 14, 2012.
- (s22) "Poro-meccanica computazionale: risultati recenti e sviluppi futuri", Seminar at University of Catania, Dipartimento di Ingegneria Civile e Ambientale - April 23, 2012.
- (s23) [*"Modellazione numerica di mezzi porosi saturi"*](#) in: [*"Corso breve in modellazione numerica avanzata in ingegneria geotecnica"*](#), Eucentre, Pavia, 28–29 October, 2011.

- (s24) "Analysis of Tunnel Failure in Partially Saturated Grounds using Non-Standard Finite Element Methods" in: ["Computational Modeling in Geotechnics and Tunneling"](#) International workshop (R. Borja, C. Callari, A. Gens, K. Soga, P. Vermeer, A. Whittle) organized by SFB-837 Research Center in Ruhr-University Bochum, 7-8 July, 2011.
- (s25) ["Strain localization in partially saturated porous media: thermodynamics, numerical formulation, applications"](#), SFB-837 Research Center in Ruhr-University Bochum, 6 July, 2011.
- (s26) ["Mechanics of porous media: from thermodynamics to applications. A short introductory course."](#) (C. Callari, K. Wilmanski, C. Lai). Organized by Eucentre, University of Pavia and IUSS, 10 February 2011.
- (s27) ["Introduzione alla meccanica dei mezzi porosi saturi"](#), seminar at University of Pavia, Dipartimento di Meccanica Strutturale, 7 July 2010.
- (s28) "Fundamentals of design, construction and monitoring of tunnels", seminar at the Ecole Centrale de Lyon, 7 April, 2010.
- (s29) "Advances in the analysis of strain localization in porous media", seminar at the Ecole Centrale de Lyon, Dép. de Mécanique de Solides, Génie Mécanique, Génie Civil (MSGMGC), Laboratoire de Tribologie et Dynamique des Systèmes (LTDS), 25 March, 2010.
- (s30) "Meccanica dei mezzi porosi: Termodinamica, equazioni costitutive, formulazione numerica e applicazioni", seminar at the University of Calabria, Dipartimento di Strutture, 24-25 February, 2010.
- (s31) ["Analisi numerica dell'interazione sismica fra liquidi, struttura e fondazione"](#), seminar of the course *Metodi Numerici nell'Ingegneria Sismica*, CISM-LAB, Udine, 24-25 February 2009.
- (s32) "Recent research on simulation of localized failure in multiphase porous media " seminar at the Université Joseph Fourier, Grenoble - Laboratoire Sols Solides Structures - Risques, 19 March 2009.
- (s33) "Grandi Infrastrutture dell'Ingegneria Civile: interazione con il territorio e con le sue risorse", seminar of the Master course "Pro.d.u.c.t.i.v.e. Coast", Università del Molise, 30 May 2008.
- (s34) ["Analisi numerica dell'interazione sismica fra liquidi, struttura e fondazione"](#), seminar at the course *Metodi Numerici nell'Ingegneria Sismica*, CISM-LAB, Udine, 18-20 December 2007.
- (s35) "Comportamento in deformazioni finite delle argille: Modellazione ed integrazione numerica nell'ambito della teoria dell'elasto-plasticità moltiplicativa", seminar at Università di Palermo DISG, 1997.

6. List of invited presentations

- (p1) "The role of damage poromechanics in the modeling of interfaces in production/injection wells", XXIV Congresso AIMETA, Università di Roma "La Sapienza", Roma, 16-19 settembre 2019
- (p2) "The outlets of the Albano and Fucine Lakes and their influence from Roman times up to the birth of modern tunnel engineering", *ITA-AITES World Tunnel Congress (WTC 2019)*, May 3-9, 2019, Naples, Italy
- (p3) "Vulnerabilità sismica delle scuole: motivi, decisioni e responsabilità", [Forum "Ecosistema Scuola" organizzato da Legambiente - La nuova ecologia - Kyoto Club](#), Napoli, 18 ottobre 2018.
- (p4) "Computational Methods for Localized Erosion in Porous Media", **Keynote Lecture** at [9th International Conference for Computation Methods \(ICCM2018\)](#), Rome, August 6th –10th, 2018.
- (p5) "Emissari dei laghi Albano e Fucino: modelli di epoca romana per la nascente moderna ingegneria delle gallerie" convegno della Società Italiana Gallerie: ["-1 anno dal WTC via per montes excisa: le opere in sotterraneo incontrano architettura, archeologia e arte"](#). Napoli, 11 maggio 2018.
- (p6) "A new algorithm for the tracking of shear failure surfaces based on incompatible modes and strong discontinuity kinematics", First Joint GACM-GIMC workshop on ["Common Research Interests in Computational Mechanics"](#), [CISM Udine](#) February 28 - March 1, 2018.
- (p7) "Valutazioni della sicurezza sismica di edifici scolastici in Molise", [Giornata Nazionale per la Sicurezza nelle Scuole, Analisi e prospettive per un modello regionale di edilizia scolastica](#), Campobasso, 22 novembre 2017.
- (p8) "Seismic vulnerability and exposure of residential buildings on a territorial scale in Campobasso", [EKSOSKE 2017 - International Workshop on Green Infrastructures](#), University of Molise, Campobasso - November 15-17, 2017.
- (p9) "Face Stability Analysis in Mechanized Tunnelling: A Novel FE Approach Based on Incompatible Modes and Strong Discontinuity Kinematics", by A. Alsahly*, C. Callari and G. Meschke, 14th U.S. National Congress on Computational Mechanics July 17-20, 2017, Montreal, Quebec, Canada

- (p10) "A new approach for the shear localization analysis of strong discontinuous fields based on incompatible modes in frictional materials", by A. Alsahly*, C. Callari and G. Meschke, EUROMECH Colloquium 572, Constitutive Modelling of Soil and Rock, Innsbruck, Austria, 2016
- (p11) "Applicazione della poro-meccanica del danno all'analisi dei pozzi di idrocarburi" by V. Fasano*, C. Callari, Geotecnica ed Energia, Ordine degli Ingegneri della Provincia di Roma, Roma, 8 aprile 2016.
- (p12) "Current collaborative research on computational poro- and geo-mechanics at Unimol", MEGE - GDR Atelier thématique "Instabilité et rupture dans les sols roches et bétons: Comportement Constitutif et application aux ouvrages. Grenoble, 21-22 January 2016
- (p13) "A poroelastic law to model damage in pressurized interfaces, with applications to oil/gas wells", Coupled Problems 2015, VI International Conference on Coupled Problems in Science and Engineering, San Servolo, Venice, Italy, 18-20 May, 2015
- (p14) "Numerical assessment of tunnel face stability below the water table", 14th Conf. of International Association for Computer Methods and Advances in Geomechanics (14th IACMAG), September 22-25, 2014, Kyoto
- (p15) "A discontinuity tracking algorithm based on assumed enhanced modes" by A. Alsahly*, C. Callari and G. Meschke, 11th World Congress on Computational Mechanics (WCCM XI), 5th European Conference on Computational Mechanics (ECCM V), 6th European Conference on Computational Fluid Dynamics (ECFD VI), July 20-25, 2014, Barcelona, Spain.
- (p16) "Analisi del danneggiamento di pozzi esistenti in siti di stoccaggio di CO₂". Problemi attuali e prospettive nell'ingegneria delle strutture, Maratea, 26-27 settembre 2013
- (p17) "A Homogenization-based Model for Damage in Multiphase Porous Media", by F. Gemelli*, D. Caillerie, C. Dascalu and C. Callari, II International Conference on Computational Modeling of Fracture and Failure of Materials and Structures (CFRAC 2011), Barcelona, Spain, 6-8 June 2011.
- (p18) "Strong Discontinuities in Partially Saturated Media at Failure" F. Armero*, C. Callari, 16th US National Congress of Theoretical and Applied Mechanics (USNCTAM 2010), 27/6- 2/7, 2010, State College, Pennsylvania.
- (p19) "Probabilistic Seismic Assessment of Concrete Dams", A. Lupoi*, C. Callari, International Workshop on Protection of build environment against earthquakes, Ljubljana, 27-28. August 2010
- (p20) "Three-dimensional coupled analysis of desaturation induced by an advancing underground opening", Int. Conf. on Computational Methods for Coupled Problems in Science and Engineering (COUPLED PROBLEMS 2009), Ischia, 8-10 June 2009.
- (p21) "Tecniche di protezione dal fuoco di strutture a tunnel", Giornata di studi: "Costruire in sicurezza: la prevenzione incendi per la salvaguardia del costruito e del territorio" Università del Molise - Facoltà di Ingegneria, Termoli, 30 January 2008.
- (p22) "Analysis of displacement discontinuities in variably saturated poroplastic solids", Colloque Lagrange 2008, Ecole Polytechnique – La Ferme des Vallées - Paris, December 6-8, 2007.
- (p23) "Recent Research on Large Civil Infrastructures", M.E.E.T.I.N.G. Project , Kick-off Meeting, Università del Molise - Facoltà di Ingegneria, Termoli, November 29, 2007
- (p24) "Numerical treatment of fluid-flow boundary conditions for partially saturated porous solids", Unilateral Problems in Structural Analysis VI, Siracusa - 7-9 June, 2007.
- (p25) "Effetti tridimensionali delle operazioni di serbatoio in presenza di accoppiamento idro-meccanico", "[2° Convegno - Problemi strutturali nell'ingegneria della dighe](#)", Accademia dei Lincei, 12-13 April 2007.
- (p26) "Nonlinear Geometric Effects on the Localized Failure of Poroplastic Solids", 3rd International Conference on Structural Stability and Dynamics, Kissimmee, Florida, June 2005
- (p27) "Finite-strain analysis of poro-elastoplastic solids in presence of displacement discontinuities", Colloquio Lagrange 2004, Venezia.
- (p28) "Construction and thirty-year operation of a large Italian rockfill dam", Journées de Géologie des LPC, Ax-les-Thermes, France, 5-7 October 2004
- (p29) "The role of hydro-mechanical coupling in the behaviour of dam-foundation system", Computational Mechanics, WCCM VI, Sept. 5-10, 2004, Beijing, China.
- (p30) "On the Modeling of Localized Failures in Saturated Porous Media through Strong Discontinuities", by F. Armero*, C. Callari, Computational Mechanics, WCCM VI, Sept. 5-10, 2004, Beijing, China
- (p31) "Interazioni tra diga e ammasso roccioso di fondazione", "[Problemi strutturali nell'ingegneria delle dighe](#)", Accademia dei Lincei, 26-27 February 2004.

- (p32) “Three-dimensional coupled analyses of tunnels in saturated media: Indications for an effective two-dimensional simulation procedure”, Colloquio Lagrange 2002, Ravello.
- (p33) “Numerical analysis of localization effects on tunneling induced displacements”, Colloquio Lagrange Geotechnique, 2002, Paris.
- (p34) “Analysis of strain localization induced by tunneling”, Colloquio Lagrange 2001, Le Mont-Saint-Michel, 2001.
- (p35) “A strong-discontinuity method for the analysis of localization in coupled poro-plastic solids”, First CSMA-GIMC Joint Workshop on Modern Issues in Modelling and Computation of Damage and Failure, 2001, Cefalù.
- (p36) “Recent advances in the analysis and numerical simulation of strain localization in coupled poro-plastic media”, Colloquio Lagrange 2000, Taormina, 2000
- (p37) “Aspetti geotecnici nel progetto dell’ospedale sismicamente isolato di Frosinone”, Workshop on Seismic Design and Retrofitting of Hospitals in Seismic Areas, Firenze, 1999.

7. List of other presentations at conferences and research meetings

- (p38) “Numerical methods for piping erosion in hydraulic works”, *26th Annual Meeting of European Working Group on Internal Erosion in Embankment Dams, Levees and Dikes, and their Foundations (EWG-IE)* 10-13 September 2018 –Milano, Italy.
- (p39) "Discrete modelling of backward front propagation in piping erosion", F. Froio*, D.K. Tran, N. Prime, C. Callari, E. Vincens, *2016 International Conference of the ASCE Engineering Mechanics Institute (EMI 2016)*.
- (p40) "Computational analysis of propagating localized erosion in porous media" C. Callari, A. F. Rotunno*, F. Froio, *2016 International Conference of the ASCE Engineering Mechanics Institute (EMI 2016)*.
- (p41) "Isogeometric collocation methods for poromechanics", S. Morganti*, C. Callari, F. Auricchio, A. Reali, *XXI Convegno Nazionale di Meccanica Computazionale, VIII Riunione del Gruppo Materiali AIMETA*, IMT, Scuola Alti Studi di Lucca, 27-29 giugno 2016
- (p42) "A finite element formulation for localized erosion propagating in porous media" A. F. Rotunno*, C. Callari, F. Froio, *XXI Convegno Nazionale di Meccanica Computazionale, VIII Riunione del Gruppo Materiali AIMETA*, IMT, Scuola Alti Studi di Lucca, 27-29 giugno 2016
- (p43) "Computational modeling of damage in hydrocarbon wells" *GDRI GEOMECH - Multi-Physics and Multiscale Couplings in Geo-environmental Mechanics - Séminaire annuel, La Rochelle, 20-22 juin 2016*
- (p44) "The modeling of interfaces in hydrocarbon wells by damage poromechanics", XXII Congresso AIMETA, Associazione Italiana di Meccanica Teorica e Applicata, Università di Genova, 14-17 Settembre 2015
- (p45) "Interface poroelastic laws to model fluid-induced damage in oil wells", XX Convegno Nazionale di Meccanica Computazionale, VII Riunione del Gruppo Materiali AIMETA, Università di Cassino e del Lazio meridionale, Cassino, 11-13 giugno 2014
- (p46) “Damage analysis for wells in CO2 storage sites” *EURO:TUN 2013, 3rd International Conference on Computational Methods in Tunnelling and Subsurface Engineering*, Ruhr University Bochum, 17-19 April 2013.
- (p47) “Analysis of strain localization in a porous dilatant layer subjected to shear waves”, GIMC 2010 XVIII Convegno Italiano di Meccanica Computazionale Siracusa, 22-24 settembre 2010
- (p48) “U.R. UniMol: Attività e risultati”, final meeting among U.R. of PRIN2007 on concrete dams, Politecnico di Milano, 7 June 2010
- (p49) “Three-dimensional interaction between concrete gravity dam and foundation rock mass in presence of coupling with seepage”, presentation, *Long term behaviour of dams (LTBD09)*, 12-13 October 2009, Graz, Austria.
- (p50) “A computationally oriented approach to thermodynamics of multiphase porous media”, presentation, *XIX Congresso AIMETA*, Ancona, 14-17 September 2009.
- (p51) “Three-dimensional effects of ground desaturation due to tunneling”, presentation, *EURO:TUN 2009, 2nd International Conference on Computational Methods in Tunnelling*, Ruhr University Bochum, 9-11 September 2009.
- (p52) “Effects of Strain Localization on Tunnel Stability and Induced Subsidence”, presentation, *EURO:TUN 2009, 2nd International Conference on Computational Methods in Tunnelling*, Ruhr University Bochum, 9-11 September 2009.
- (p53) "Analisi del degrado e interventi di ripristino del rivestimento di una galleria autostradale", *I Congresso Internazionale "Concrete 2009"*, Università del Molise - Facoltà di Ingegneria, Termoli, 19-20 February 2009

- (p54) "Analisi di localizzazione in mezzi porosi parzialmente saturi con il metodo delle discontinuità forti", presentation, *GIMC2008, XVII Convegno Italiano di Meccanica Computazionale*, Alghero.
- (p55) "Finite Element Formulation of Unilateral Boundary Conditions for Unsaturated Flow in Porous Solids", presentation, *8th World Congress on Computational Mechanics (WCCM8), 5th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)*, June 30 -July 5, 2008 -Venezia.
- (p56) "Analysis of strong discontinuities in partially-saturated poroplastic solids", presentation, *8th World Congress on Computational Mechanics (WCCM8), 5th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)*, June 30 -July 5, 2008 -Venezia.
- (p57) "Simulation of strain localization in multi-phase media by a multi-scale approach", *6th EUROSIM Congress*, 9-13 Sept., Ljubljana, Slovenia.
- (p58) "Strong discontinuities in coupled multiphase poro-plastic media", *9th United States National Congress on Computational Mechanics (USNCCM-9)*, San Francisco, July 23-26, 2007
- (p59) "Un metodo agli elementi finiti per continui porosi parzialmente saturi accoppiati", presentation, *GIMC2006, XVI Convegno Italiano di Meccanica Computazionale*, Bologna.
- (p60) "Finite Element Formulation of a Macroscopic Theory for Three-Phase Porous Media", presentation, *III European Conference on Computational Mechanics (ECCM 06)*, Lisbona, 5-8 giugno 2006
- (p61) "Parziale saturazione di dighe in calcestruzzo: applicazione di un modello per continui multifase e analisi di condizioni al bordo unilaterale sul flusso", second meeting among UR of PRIN2004 on concrete dams, Politecnico di Milano, January 2006
- (p62) "Effetti della parziale saturazione nell'analisi accoppiata delle dighe di calcestruzzo: Formulazione agli elementi finiti e sua validazione", first meeting among UR of PRIN2004 on concrete dams, Politecnico di Milano, September 2005.
- (p63) "Comportamento a breve e a lungo termine della diga di Monte Cotugno sul fiume Sinni", selected presentation, *XXII Convegno Nazionale di Geotecnica "Valutazione delle condizioni di sicurezza e adeguamento delle opere esistenti"*, Palermo, 22-24 September 2004.
- (p64) "Interazione idro-meccanica fra diga di calcestruzzo e ammasso roccioso di fondazione: risultati acquisiti e obiettivi futuri", third meeting among UR of PRIN2002 on concrete dams, Politecnico di Milano, September 2004
- (p65) "Coupled finite element analysis of the construction of a large Italian embankment dam founded on stiff clay", presentation, *Ninth International Symposium on Numerical Models in Geomechanics – NUMOG IX*, Ottawa, Canada, June 2004
- (p66) "Localizzazione in mezzi saturi soggetti a grandi deformazioni", Incontro Annuale dei Ricercatori di Geotecnica (IARG 2004), Trento.
- (p67) "Discontinuità forti in mezzi poro-plastici saturi in deformazioni finite", second meeting among UR of PRIN2002 on concrete dams, Politecnico di Milano, 30 May 2003.
- (p68) "Analisi accoppiata dell'interazione tra diga e ammasso roccioso di fondazione", second meeting among UR of PRIN2002 on concrete dams, Politecnico di Milano, 30 maggio 2003.
- (p69) "Analisi di gallerie superficiali con un metodo agli elementi finiti non convenzionale", selected presentation, *XXI Convegno Nazionale di Geotecnica "Opere geotecniche in ambiente urbano"*, L'Aquila, 11-13 September 2002.
- (p70) "The application of a strong-discontinuity FEM to the analysis of strain localization induced by underground openings", presentation, *Eighth International Symposium on Numerical Models in Geomechanics – NUMOG VIII*, 2002.
- (p71) "Analisi numerica della localizzazione indotta dallo scavo di gallerie superficiali in terreni saturi", *Incontro Annuale dei Ricercatori di Geotecnica (IARG 2002)*, Napoli.
- (p72) "Un metodo alle discontinuità forti per l'analisi di localizzazione in mezzi poro-elastoplastici saturi", presentation, *GIMC2000, XIII Convegno Italiano di Meccanica Computazionale*, 2000, Brescia.
- (p73) "A strong discontinuity approach for the analysis and the numerical simulation of strain localization in saturated poro-plastic media", presentation, *Symposium on Mathematical Models in Soil Mechanics*, 2000, Scilla, Reggio Calabria.
- (p74) "Finite-element implementation of a finite-strain Cam-clay model", presentation, *5th International Conference on Computational Plasticity (COMPLAS V)*, Barcellona, 1997.
- (p75) "A return-map algorithm for a finite-strain Cam-clay plasticity model", presentation, *Joint Conference of Italian Group of Computational Mechanics and Ibero-Latin American Association of Computational Methods in Engineering*, Padova, 1996.

- (p76) “FEM validation of a double porosity model for consolidation analysis”, presentation, 8th *European Young Geotechnical Engineers Conference – EYGEC*, Stará Lesná, Slovak Republic, 1994