

**PERSONAL INFORMATION**

First name, family name: **Gian Michele Calvi**  
 ORCID ID: <https://orcid.org/0000-0002-0998-8882>  
 Nationality: Italian  
 Date of birth: June 18, 1957  
 URL for website: [www.eucentre.it](http://www.eucentre.it)

**EDUCATION**

1987      Doctorate in Structural Engineering (PhD), Politecnico di Milano, Italy  
 1985      Master of Science in Civil Engineering (MSc), University of California, Berkeley, USA  
 1981      Master in Civil Engineering (MEng), Università di Pavia, Italy

**CURRENT POSITIONS**

2010 – today   Professor and Director of the Centre for Research on Understanding and Managing Extremes  
                   Scuola Universitaria Superiore IUSS, Pavia, Italy  
 2003 – today   Director of Science  
                   European Centre for Training and Research in Earthquake Engineering (Eucentre), Pavia, Italy  
 2013 – today   Adjunct Professor  
                   North Carolina State University, Raleigh, NC, USA

**PREVIOUS POSITIONS**

2000 – 2010   Professor, Department of Structural Mechanics, University of Pavia  
 1992 – 1999   Associate Professor, Department of Structural Mechanics, University of Pavia  
 1987 – 1992   Assistant Professor, Department of Structural Mechanics, University of Pavia

**FELLOWSHIPS AND AWARDS**

2020      **IABSE Outstanding Paper Award 2020** (Scientific Paper - *Once upon a Time in Italy: The Tale of the Morandi Bridge*)  
 2020      **Park and Paulay Lecture Award**, New Zealand Society for Earthquake Engineering (NZSEE), Wellington, NZ  
 2017      **Distinguished Lecture Award**, Dept. of Civil, Architectural, and Environmental Engineering (CAEE), University of Texas at Austin, USA  
 2015      Inaugural lecture (*Prolusione*) for the academic year 2015-2016 at the IUSS Pavia, Italy  
 2014      **ROSE School Prize**, Pavia, Italy  
 2012      **Shaw Lecture Award**, North Carolina State University, USA  
 2009      **Honorary Doctorate**, Universidad Nacional de Cuyo, Mendoza, Argentina  
 2009      **Prize La Lombardia per il lavoro**, Milano, Italy  
 2009      Inaugural lecture (*Prolusione*) for the academic year 2009-2010 at the Università di Pavia, Italy  
 2007      **Vote of Thanks**, for promotion to professorship of Julian Bommer, Imperial College, London  
 2006      **fib Award for Outstanding Concrete Structure** for the contribution to the design and construction of the *Rion-Antirion Bridge*, Lausanne, Switzerland  
 1985      **Research fellowship**, Foundation Stiftelsen Blanceflor Boncompagni Ludovisi, Stockholm, Sweden  
 1984      **Fulbright - Hays Fellowship**, Commission for Cultural Exchanges between U.S.A. and Italy

**SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2004 – 2019   Advisor of twenty-three Post-Doctoral Fellows, ROSE (later UME) School, IUSS and University of Pavia  
 2004 – 2019   Advisor of twenty-four Ph. D. Students, ROSE (later UME) School, IUSS and University of Pavia  
 2004 – 2019   Advisor of forty M. Sc. Students, ROSE (later UME) School, IUSS and University of Pavia  
 1987 – 2010   Advisor of forty-six M. Sc. Students, Department of Structural Mechanics, University of Pavia  
 1998 – 2002   Advisor of four Ph. D. Students, Department of Structural Engineering, Politecnico di Milano

**TEACHING ACTIVITIES**

- 2007 – 2019 Short courses taught in: Juneau, Anchorage, San Francisco, Los Angeles, Raleigh, San Diego (all USA), Toronto, Vancouver (Canada), Mendoza (Argentina), Santiago (Chile), San José (Costa Rica), Amman (Jordan), Shanghai (China)
- 1996 – 2000 Faculty member, Doctoral School in Earthquake Engineering, Politecnico di Milano
- 1990 Visiting Professor, University of California, San Diego

**ORGANISATION OF SCIENTIFIC MEETINGS**

- 2000 – 2019 Organizer of the *International ROSE School Seminars* (yearly), Pavia, 200 participants
- 2007 Org. and Editor, US-Italy Workshop on *Seismic Design of Bridges*, Pavia, 60 p. (by invitation)
- 1998 Org. and Ed., US-Italy Workshop on *Bridge Protection Systems*, New York, 60 p. (by invitation)
- 1995, 1997 Org. and Ed., Japan-Italy Workshops on *Seismic design and retrofit of bridges*, Tsukuba and Pavia, 60 p., (by invitation)
- 1994, 1996 Org. and Ed., US-Italy Workshops on *Seismic evaluation and retrofit of building structures*, Pavia and New York, 40 p. (by invitation)
- 1991, 1994 Org. and Ed., International Workshops on *Seismic design and retrofitting of reinforced concrete bridges*, Bormio, Italy, and Queenstown, New Zealand, 40 p. (by invitation)

**ISTITUTIONAL RESPONSIBILITIES**

- 2000 – 2015 **Director**, Graduate School (MSc and PhD) in Earthquake Engineering, IUSS and University of Pavia
- 2003 – 2014 **Founder and President**, Eucentre Foundation, Pavia
- 2009 – 2010 **Director**, Department of Structural Mechanics, University of Pavia
- 2003 – 2005 **Director**, Department of Structural Mechanics, University of Pavia
- 1997 – 2003 **Head of the Structures Laboratory**, Structural Mechanics Department, University of Pavia

**COMMISSIONS OF TRUST**

- 2016 – 2017 Chairman of the commission for the evaluation of the Serra-Hunter professor candidates at the Universidad Politecnica de Catalunya (UPC)
- 2013 – 2015 Chairman of the commission for the evaluation for promotion of all professors of structural engineering in Italian universities
- 2012 – today Director of the International Association of Earthquake Engineering, Tokyo, Japan
- 2008 – today Chief Editor of the journal *Progettazione Sismica*, IUSS Press, Pavia, Italy
- 2000 – today Reviewer of research proposals for: *National Science Foundation*, Washington, USA, *UK Research Council*, London, UK, *Austrian Science Fund*, Vienna, Austria, *Swiss National Science Foundation*, Bern, Switzerland, *Comisión Nacional de Investigación Científica y Tecnológica of Chile*, Santiago, Chile
- 2000 – today Reviewer of applications to assistant professor or for promotion to associate or full professorship in the following universities: UC Berkeley, UC San Diego, UT Austin, NCSU Raleigh, Georgia Tech Atlanta, Cincinnati (all USA), IC London (UK), Toronto (Canada), Adelaide (Australia), EPFL Lausanne and ETH Zurich (Switzerland)
- 1999 – today Associate Editor of the *Journal of Earthquake Engineering*, Taylor and Francis
- 2008 – 2013 Member of the Board of Directors of the Global Earthquake Model (GEM) Foundation, Pavia
- 2005 – 2013 Member of the evaluation panel for the Institute for Sustainability and Innovation in Structural Engineering (ISISE), Universities of Coimbra and Minho, Portugal
- 2006 – 2010 Member of the Scientific Board of the National Institute of Oceanography and Experimental Geophysics (OGS), Trieste, Italy
- 2004 – 2008 Member of the Board of Directors of the National Institute of Geophysics and Volcanology (INGV), Roma, Italy
- 2002 – 2008 Chairman of the Seismic Risk Section of the National Commission for Prevention, Mitigation and Management of Great Risks (*Commissione Grandi Rischi*), Roma, Italy
- 2008 – 2010 Component of the National Commission for Prevention, Mitigation and Management of Great Risks (*Commissione Grandi Rischi*), Roma, Italy
- 2003 – 2004 Chairman of the Committee created to re-write the Italian Seismic Design Code, Roma, Italy
- 1998 – 2004 Member of several Project Teams related to Eurocode 8 (structure in seismic regions)

## SELECTED PUBLICATIONS

- Magenes, G., **Calvi, G.M.**, In-plane seismic response of brick masonry walls, *Earthquake engineering & structural dynamics* 26 (11), 1997, 1091-1112
- Calvi, G.M.**, A displacement-base design approach for vulnerability evaluations of classes of buildings, *Journal of Earthquake Engineering*, 3 (03), 1999, 411-438
- Palermo A., Pampanin, S., **Calvi, G.M.**, Concept and development of Hybrid Systems for Seismic-Resistant Bridges, *J. of Earthquake Engineering*, 9:6, 2005, 899-921
- Calvi, G.M.**, Pavese, A., Rasulo, A. and Bolognini, D., Experimental and numerical studies on the seismic response of r.c. hollow bridge piers, *Bul. of Earthquake Engineering*, 3:3, 2005, 267-297
- Calvi G.M.**, Pinho R., Magenes G., Bommer J.J., Restrepo-Vélez L.F., Crowley H., The development of seismic vulnerability assessment methodologies for variable geographical scales over the past 30 years, *ISET J. of Earthquake Engineering Technology*, 43:3, 2006, 75-104
- Sullivan, T.J., Priestley M.J.N., **Calvi G.M.**, Estimating higher-mode response of ductile structures, *J. of Earthquake Engineering*, 12:3, 2008, 456-472
- Petrini L., Maggi C., Priestley M. J. N., **Calvi G. M.**, Experimental Verification of Viscous Damping Modeling for Inelastic Time History Analyses, *J. of Earthquake Engineering*, 12:1, 2008, 125-45
- Pennucci D., **Calvi G.M.**, Sullivan T.J., Displacement-based design of precast walls with additional dampers, *J. of Earthquake Engineering*, 13:1, 2009, 40-65
- Calvi, G.M.**, Sullivan T.J., Villani A., Conceptual Seismic Design of Cable-Stayed Bridges, *J. of Earthquake Engineering*, 14, S8, 2010, 1139-1171
- Pennucci D., Sullivan T.J., **Calvi, G.M.**, Displacement reduction factors for the design of medium and long period structures, *J. of Earthquake Engineering*, 15:1, 2011, 1-29
- Stucchi M., Meletti C., Montaldo V., Crowley H., **Calvi G. M.**, Boschi, E. Seismic Hazard Assessment (2003-2009) for the Italian Building Code, *Bul. of the Seismological Society of America*, 101:4, 2011, pp. 1885–1911
- Calvi G. M.**, Choices and Criteria for Seismic Strengthening, *J. of Earthquake Engineering*, 17:6, 2013, 769-802
- Calvi, G.M.**, Displacement-based seismic design of bridges, *Structural Engineering International*, Volume 23, Number 2, May 2013 , pp. 112-121
- Smyrou, E., Sullivan, T., Priestley, N. and **Calvi, G.M.**, (2013). Sectional Response of T-Shaped RC walls. *Bulletin of Earthquake Engineering*, Volume 11, Issue 4, pp 999-1019.
- Welch, D.P., Sullivan. T.J. and **Calvi G.M.**, (2014). Developing Direct Displacement-Based Procedures for Simplified Loss Assessment in Performance-Based Earthquake Engineering, *Journal of Earthquake Engineering*, 18:290–322
- Sullivan, T.J., Welch, D.P., **Calvi, G.M.**, (2014). Simplified Loss Estimation for Seismic Performance Classification, in State-of-the-Art and Future Challenges in Earthquake Engineering, *Journal of Earthquake Engineering and Engineering Vibration*, Vol. 13, No. S1, 2014, 95-122
- Agha Beigi, H., Christopoulos, C., Sullivan, T., and **Calvi, G.M.**, (2014). Gapped-Inclined Braces for Seismic Retrofit of Soft-Story Buildings. *J. Struct. Eng.*
- Agha Beigi H, Christopoulos C., Sullivan T.J., **Calvi G.M.** (2015) Seismic Response of a Case Study Soft story Frame Retrofitted Using a GIB System, *Earthquake Engineering & Structural Dynamics*, 10
- Pennucci, D., Sullivan, T.J., and **Calvi, G.M.** (2015), Inelastic Higher-Mode Response in Reinforced Concrete Wall Structures, *Earthquake Spectra*, 31(3)
- Borzi, B., P.Ceresa, P. Franchin, F. Noto, **G. M. Calvi**, P. E. Pinto (2015) Seismic Vulnerability of the Italian Roadway Bridge Stock, *Earthquake Spectra*
- Agha Beigi H., Sullivan T., Christopoulos C., **Calvi G.M.** (2015), Factors influencing the repair costs of soft story RC frame buildings, *Engineering Structures*
- Agha Beigi H., Christopoulos C., Sullivan T., and **Calvi G.M.** (2016) Cost benefit analysis of buildings retrofitted using GIB systems, *Earthquake Spectra*, 32(2), 861-879
- Ruggiero D.M., E.C. Bentz, **G.M. Calvi**, M.P. Collins (2016), Shear response under reversed cyclic loading. *ACI Structural Journal*, 113:6
- Calvi, P.M., M. Moratti and **G.M. Calvi** (2016), Seismic isolation devices based on sliding between surfaces with variable friction coefficient, *Earthquake Spectra*, 32:4
- Calvi, G.M.** (2018). Re-visiting design earthquake spectra. *Earthquake Engineering and Structural Dynamics*, 47:13, 2627-2643
- Calvi, G.M.**, D. Rodrigues and V. Silva (2018). Response and design spectra from Italian earthquakes 1972-2017. *Earthquake Engineering and Structural Dynamics*, 47:13, 2644-2660
- Calvi, P.M. and **G.M. Calvi** (2018). Historical development of friction-based seismic isolation systems. *Soil Dynamics and Earthquake Engineering* 106, 14-30

- Filiatrault, A., D. Perrone, R.J. Merino and **G.M. Calvi** (2018). Performance-based seismic design of nonstructural building elements. *Journal of Earthquake Engineering*, 1-33
- Barone, S., A. Pavese and **G.M. Calvi** (2019), Experimental dynamic response of spherical friction-based isolation devices, *Journal of Earthquake Engineering*, 23:9, 1465-1484
- Calvi, G.M.** (2019). On the correction of spectra by a displacement reduction factor in direct displacement-based design and assessment. *Earthquake Engineering & Structural Dynamics* 48:6, 678-685
- Moratti, M., F. Gaia, S. Martini, C. Tsioli, G. Grecchi, C. Casotto, **G.M. Calvi** (2019). A methodology for the seismic multi-level assessment of unreinforced masonry church inventories in the Groningen area. *Bulletin of Earthquake Engineering* 17 (8), 4625-4650
- GM Calvi**, M Moratti, GJ O'Reilly, N Scattarreggia, R Monteiro, D Malomo (2019). Once upon a time in Italy: the tale of the Morandi bridge. *Structural Engineering International* 29 (2), 198-217
- Calvi, G.M.** and G. Andreotti (2019). Effects of local soil, magnitude and distance on empirical response spectra for design. *Journal of Earthquake Engineering, ...*, 1-28
- GJ O'Reilly, G.J. and **G.M. Calvi** (2020). Conceptual seismic design in performance-based design. *Earthquake Engineering and Structural Dynamics*, 48:4, 389-411
- D Malomo, N Scattarreggia, A Orgnoni, R Pinho, M Moratti, **GM Calvi** (2020). Numerical study on the collapse of the Morandi bridge. *ASCE Journal of Performance of Constructed Facilities*, 34 (4), 04020044

## MAJOR MONOGRAPHS

G.M. Calvi is the author of some major monographs, with a total number of citations exceeding 5,000. Four monographs are listed below; those indicated under numbers 1 and 3 still constitutes the international standard of reference in their field. The first one has been translated into Chinese and Japanese.

- 1 Priestley M.J.N., F. Seible and **G.M. Calvi**, *Seismic design and retrofit of bridges*, Wiley, New York, 1996
- 2 Petrini, L., R. Pinho and **G.M. Calvi**, *Criteri di Progettazione Antisismica degli Edifici (Criteria for seismic design of buildings)*, IUSS Press, Pavia, 2004
- 3 Priestley, M.J.N., **G.M. Calvi** and M.J.Kowalsky, *Displacement Based Seismic Design of Structures*, IUSS Press, Pavia, 2007
- 4 **Calvi, G.M.** and R. Nascimbene, *Progettare i gusci (Design of shells)*, IUSS Press, Pavia, 2011

## GRANTED PATENTS

G.M. is one of the holders of the following patents:

### 1 Pillar for building constructions

Patent cooperation treaty application number WO2013050812 (A1), April 2013, European patent application number EP2683889 (A1), January 2014

### 2 Gapped inclined brace (GIB) system

US provisional patent filed December 2, 2013, PCT filed December 2, 2014

## INVITED PRESENTATIONS TO MAJOR INTERNATIONAL CONFERENCES

G.M. Calvi has been invited to deliver keynote lectures to several tens of conferences, including two World and three European conferences on Earthquake Engineering. Some relevant presentations are listed below.

- Performance-based approaches for seismic assessment of existing structures, *11<sup>th</sup> European Conf. on Earthquake Eng.*, Paris, 1998
- Recent experience and innovative approaches in design and assessment of bridges, *13<sup>th</sup> World Conf. on Earthquake Eng.*, Vancouver, 2004
- Innovative approaches to advanced education and multidisciplinary research, *3<sup>rd</sup> Int. Symposium on Wind Effects on Buildings and Urban Environments (ISWE3)*, Tokyo, 2008
- Engineers understanding of earthquakes demand and structures response, *14<sup>th</sup> European Conf. on Earthquake Eng.*, Ohrid, 2010
- Alternative choices and criteria for seismic strengthening, *15<sup>th</sup> World Conf. on Earthquake Eng.*, Lisbon, 2012

- Energy efficiency and disaster resilience: a common approach, *Int. Conf. on Multi-hazard Approaches to Civil Infrastructure Engineering (ICMAE)*, Chicago 2014
- A seismic performance classification framework to provide increased seismic resilience, *2<sup>nd</sup> European Conf. on Earthquake Eng. and Seismology*, Istanbul 2014
- Concepts and technologies for friction-based isolation, *VII National Conference on Earthquake Engineering*, Bogotá 2015
- Seismic assessment and rational renovation of the structural heritage, *LABSE Symposium Engineering the Future*, Vancouver 2017
- Performing full scale in situ dynamic testing, *7<sup>th</sup> International Conference on Advancement in Structural Testing*, Pavia 2017
- Experiences and trends in seismic design of bridges, *2<sup>nd</sup> International Bridge Seismic Workshop*, Shanghai, 2017
- Lecciones entretenidas y curiosas sobre las causas y efectos de los terremotos, *Ministerio de la Educación Superior, Ciencia y Tecnología*, Santo Domingo, 2018
- El nudo gordiano de la investigación y la educación en la ingeniería sísmica, *Museo Nacional de Historia Natural*, Santo Domingo 2018
- A redefinition of seismic input for design and assessment, *16<sup>th</sup> European Conf. on Earthquake Eng.*, Thessaloniki, 2018
- Once upon a time in Italy: the tale of the Morandi Bridge, *The Third Istanbul Bridge Conference, Istanbul 2018*
- Revisiting earthquake resistant design, *12<sup>th</sup> Canadian Conf. on Earthquake Eng.*, Quebec, Canada, 2019

## INTERNATIONAL RECOGNITIONS

In addition to what is listed in the sections “*Fellowships and Awards*” and “*Commissions of Trusts*”, consider the following achievements.

**The ROSE School** – In 2000 G. M. Calvi created a graduate school, known as *ROSE School* ([www.roseschool.it](http://www.roseschool.it)). The school is based on an innovative teaching system, with courses taught in series rather than in parallel. The faculty and the students are completely international. Last year more than 1,500 applications were received from more than 100 different countries and the rate of admission has been lower than 5%.

**The Eucentre Foundation** – In 2003 G. M. Calvi created the European Centre for Training and Research in Earthquake Engineering ([www.eucentre.it](http://www.eucentre.it)). Eucentre is based on a laboratory with the most powerful shaking table in Europe, a three-dimensional reaction wall systems and a testing rig for isolating and dissipating devices and special structural elements. The initial investment was about 12 M€, provided by the funding institutions on the pure base of thrusting a project and the person who conceived it. The foundation is prospering without any public steady contribution, counting on research project for about 6 M€ per year.

**The GEM Foundation** – In 2008 G. M. Calvi obtained the assignment of the Secretariat of a newly conceived project to Eucentre, from the OECD. This resulted in the creation of the GEM Foundation ([www.globalquakemodel.org](http://www.globalquakemodel.org)), a public-private endeavor which is internationally recognized as a world center to bring knowledge, data and resources for earthquake risk assessment worldwide together, as a critical step towards improved understanding and actions that both manage and reduce risk.

## MAJOR CONTRIBUTIONS TO THE EARLY CAREER OF EXCELLENT RESEARCHERS

G. M. Calvi has been the mentor of more than 100 graduate students and post doc fellows. Most of them are professors and professional leaders in many countries. At the last World Conference on Earthquake Engineering, held in Santiago, Chile, on January 2017, the ROSE School was represented by the largest share of Alumni, worldwide. At the ROSE School dinner more than 60 former students celebrated their reunion.

Due to the space restrictions, only two examples of excellent researchers who are today recognized scientific world leaders are presented:

**Stefano Pampanin** obtained his Ph.D. at the Politecnico di Milano in 2000 under my guidance and remained with me for the next two years. He is now professor at the University of Canterbury (New Zealand) and President of the New Zealand Society of Earthquake Engineering.

**Rui Pinho** joined my research group soon after completing his Ph.D. at the Imperial College, London, in 2001. He has been working under my guidance for several years, becoming Secretary General of the GEM Foundation (2008-2013), obtaining the rank of professor in Italy and serving now as Director of Science at Eucentre.

## EXAMPLES OF LEADERSHIP IN DESIGN

**1990 – today: The DDBD method.** The relevance and originality of the *Direct Displacement Based Design method*, developed by G. M. Calvi with M.J.N. Priestley, is best expressed by the incipit of a review by Graham Powell (Emeritus Professor at UC Berkeley): “*It is rare for a book on structural engineering design to be revolutionary. I believe that this is such a book. If you are involved in any way with seismic resistant structural design, this should be on your bookshelf, and you should read at least the first three chapters*”.

**Greece 1998 – 2004: the Rion – Antirion cable stayed bridge.** The 3 km long Rion Antirion Bridge with 250m tall piers and major spans of 560m is a recognized world masterpiece. G. M. Calvi played a major role in the Checker Team and received world recognition *for the contribution to the design and construction of the Rion–Antirion Bridge* (*fib* Award for Outstanding Concrete Structure, 2006, Lausanne, Switzerland).

**Duzce 1999 – 2004: The North Anatolian Viaduct.** The 1999 Duzce earthquake severely damaged the North Anatolian Viaduct, completed but not opened at the time. The ingenuity of the structural solution to repair and strengthen the viaduct, envisaged by G. M. Calvi, allowed to close the case opened with the Lloyds of London, the insurer, who accepted to bear all costs, since they were lower than what expected for repair only.

**L’Aquila 2009: the CASE project.** G. M. Calvi has been the designer and project manager of the CASE project for the reconstruction work after the earthquake that struck L’Aquila in April 2009. This work implied the construction of 185 base isolated new buildings in about six months, providing dwellings for about 15,000 homeless people in the region of L’Aquila. This endeavor is considered a major engineering success all over the world.

**Northern Italy 2010: Steel Bridge “La Becca” over the Po river.** In November 2010 some concern raises about the stability of a steel truss bridge about 1040 m long, constructed at the beginning of the XX century and partially demolished during the Second World War. G.M. Calvi and his team assessed an ongoing rotation of one of the pier foundation and managed to design and build two side piers with deep foundation and to perform all the inherent strengthening measure to the bridge in about two months. In March, 2011, the pier completely collapse during a flood and the structure survived resting on the side structures built for this purpose. This is one of the very few case in which an old bridge collapse has been prevented in such short time conditions.

**Costa Rica, 2015-2018.** G.M. Calvi is leading and coordinating a complex interdisciplinary effort to construct 103 new school buildings in Costa Rica for the Banco Nacional de Costa Rica and for the Banco Inter Americano de Desarrollo. This project required integrations between lawyers, business administration experts, engineers, architects, geologists, expert in education.

**Groningen, the Netherlands 2015-2022.** Due to seismic actions induced by gas extraction, great concerns rose up about the risk in a wide area, which includes some 200,000 buildings. Among them, 226 historical churches constitute a particularly relevant and difficult case. G.M. Calvi and his team developed a WEBGIS interactive system able to assess each church at different levels of complexity, including non linear push over analysis integrated by local kinematic processes. The system combined fast assessment with prioritization evaluation, allowing significant resource saving and rationally based choices.