

**TIZIANA VANORIO**  
 ASSISTANT PROFESSOR  
 Geophysics Department  
 Stanford University  
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### ACADEMIC HISTORY

- 2008 *Habilitation à diriger des recherches (HDR)*, Formal qualification to supervise research and hold a professorship position, Université de Nice Sophia Antipolis (France) — Post-degree thesis defended before an academic committee certifying candidates' high level of scientific expertise, research originality, ability to advise students and direct research. This was followed by the awarding of the title *professor with tenure*.
- 1998 Ph.D. Geophysics and Volcanology, University of Naples Federico II (Italy)
- 1992 B.S. and M.S. (Honors) Geological Science, University of Naples Federico II (Italy)

### EMPLOYMENT HISTORY

- 09/2013-Pres. Assistant Professor, Geophysics Department, Stanford University
- 2010 Invited Professor, Center for Carbonate System and Reservoir Geology, Université de Provence Aix Marseille (France)
- 2005–2013 Senior Research Scientist, Geophysics Department, Stanford University
- 2002–2005 CNRS Research Fellow, Géosciences Azur, Université de Nice Sophia Antipolis (France)
- 1999–2001 Post-doctoral Researcher, Geophysics Department, Stanford University

### PUBLIC AND PROFESSIONAL SERVICE

#### University Service (past 5 years)

- 2018-pres. University, NanoFacility Design Committee, Stanford Long-Range Planning
- 2018-2019 Geophysics, Graduate Admission Committee
- 2017 Invited speaker for Classes Without Quizzes, Reunion Homecoming Weekend, Stanford Alumni Association
- 2017-2018 Geophysics Faculty Search Committee
- 2016-2017 Geophysics Faculty Search Committee
- 2016 Invited speaker for Stanford Admit Weekend
- 2015-2016 Geophysics Faculty Search Committee
- 2015-pres. Geophysics Long-term Planning Committee
- 2014-2015 Geophysics, Graduate Admission Committee
- 2014-pres. Geophysics Outreach Committee
- 2013 SE3, Teaching Task Force Committee

#### Professional Activities (past 5 years)

- 2019 Norwegian Research Council, Review Panelist
- 2019 Technical Program, Co-Chair for *Geophysics – What's New and Innovative*, ACE AAPG
- 2019 European Association of Geosciences and Engineering (EAGE) Award Committee
- 2017 NSF Review Panelist, National Science Foundation
- 2016 Session Chair, SEG-AGU Summer Workshop, Upper Crust Physics of Rocks, Hilo, Hawaii
- 2015 DOE CAREER Award review panelist, Department of Energy

- 2014 Marie Curie Fellowship Review Panelist, European Community
- 2013 Session Co-Chair, Measuring, Imaging, and Computing to Probe Multi-scale Rock Processes, AGU Fall Meeting
- 2013 Session Chair and Technical Committee Member, 2<sup>nd</sup> Summer Rock Physics Research Workshop, Southampton, UK

## POST-DEGREE HONORS AND AWARDS

### Awards

- 2018 [Alfred Wegener Award](#), European Association of Geosciences and Engineering “*for her innovative scientific and technical contributions to petroleum geoscience and engineering*”
- 2016 [Editor’s Choice by the journal SCIENCE](#) “*Printing Out The Pores*”
- 2015 [Cover of the journal SCIENCE](#) “*Concrete Connection*”
- 2015 [Stanford VPTL, Spotlight on Innovation](#) *Through a grant from the Vice Provost for Online Learning (VPOL), [Tiziana] integrates her online materials into her pre-lab lessons so that her students can use their lab time, which is limited due to the instruments’ cost and complexity, more effectively*
- 2015 [NSF CAREER Award](#), National Science Foundation
- 2015 [Stanford's Year of Learning](#), Nominee to the Stanford "Great Teaching Showcase", Stanford University, “[Tiziana] *demonstrated a highly realistic and dynamic 3D simulation she’s designed to introduce students to her Rock Physics lab. In the past, she’s had to use valuable class time to teach how to use its many instruments. With the new simulation, that can be done before her students ever step foot in the lab*”
- 2014 [SPE Innovative Teaching Award](#), Society of Petroleum Engineering. The award recognizes faculty who demonstrated innovative teaching techniques and who encourage and equip others in academia to use similar techniques: “*Vanorio recently developed online tools that can dramatically shorten the learning curve for using complicated laboratory instruments*”
- 2011 [Editors' Citation for the Brightspots of Geophysics](#), SEG
- 2010 Best Paper of SEG and D&P Forum, SEG
- 2005 [EURYI Award, European Young Investigator Award](#), European Science Foundation, *top 5 outstanding young researchers in France (declined to move to US)*
- 2002–2005 Marie Skłodowska-Curie Fellow, European Commission
- 2000 National Research Council (Italy), NATO Fellowship
- 1999 National Research Council (Italy), Study Abroad Fellowship

### Keynotes, Invited Conference Presentations and Lectures (past 5 years)

- 2019 Invited Lecture, Workshop – Clays: New Perspectives, Challenges & Opportunities, MIT
- 2019 Invited Lecture, Department of Petroleum and Geosystems Engineering, UT Austin
- 2019 Invited Lecture, Stanford University, Civil and Environmental Engineering
- 2018 Invited Speaker (two talks), American Geophysical Union, Washington, D.C.
- 2018 Heiland Lecture, Geophysics Department, Colorado School of Mines
- 2018 Pierce Lecture, School of Civil and Environmental Engineering, MIT
- 2018 Invited Lecture, Chinese Academy of Science, China
- 2018 Keynote Speaker, SEG-CPS International Geophysics Conference, China
- 2017 Invited Speaker, American Geophysical Union, Washington, D.C.
- 2017 Invited Lecture, University of California at Berkeley, Berkeley Seismological Laboratory
- 2017 Invited Lecture, Northwestern University, Civil Engineering, IL
- 2017 Invited Lecture, Physics Colloquium, Toronto, University of Toronto, Canada
- 2017 Invited Lecture, USGS Pacific Region Colloquium, Menlo Park, CA
- 2016 Invited Lecture, Hubbert Quorum, USGS, Menlo Park, CA

- 2016 Invited Speaker, Geological Society of America, Denver, Colorado  
 2016 Keynote Speaker, 88<sup>th</sup> Congress of the Italian Geological Society, Italy  
 2016 Invited Speaker, SEG-AGU Summer Workshop, Upper Crust Physics of Rocks, Hilo, Hawaii  
 2016 Invited Speaker, EGU General Assembly, Vienna, Austria  
 2016 Invited Lecture, Peninsula Geological Society, CA  
 2015 Invited Lecture, University Joseph Fourier, Grenoble, France  
 2015 Invited Lecture, Geophysics Department, University of Pisa, Italy  
 2015 Invited Lecture, USGS, Menlo Park, Earthquake Science Center  
 2014 Invited Speaker, ICDP Workshop, Vestmannaeyjar, Iceland  
 2014 Invited Speaker, Gordon Research Conference Evolving Rock Structure: From Grain-Scale to Planet-Scale,  
 2014 Invited Lecture, School of Civil and Environmental Engineering, Georgia Tech.  
 2013 Keynote Speaker, SPE Workshop on Advanced Carbonate Reservoir Characterization, Dubai

## PUBLICATIONS

*Authors are listed in descending order of contribution and leadership. Graduate and undergraduate students are noted with an asterisk while postdoctoral/research associate advisees are noted with two asterisks. The authorship of papers involving a large group mostly follows an alphabetical order.*

- (in prep.) Head D.\* and **Vanorio, T.**, Modeling Crack-Density Evolution and Elastic Weakening in Limestones Exposed to Thermo-Chemo-Mechanical processes *JGR - SOLID EARTH, in preparation*  
 (in prep.) **Vanorio T.**, MacFarlane J.\*, and A. Clark\*\*, Rock Physics Characterization of Volcanic Ash Beds, *to be submitted to GEOPHYSICS LETT.*  
 (in prep.) MacFarlane J.\*, Ledingham G.\*, and **Vanorio T.**, A., Clark\*\*, The Role of Lime-Cemented Volcanic Ash on Permeability and Strength, *to be submitted to JGR - SOLID EARTH*
- [58] MacFarlane J.\*, **Vanorio T.**, and Monteiro P., The Resilience of Roman Concrete: Engineered By Humans, Inspired by Nature? *Submitted to PNAS*
- [57] El Husseiny, A\*., **Vanorio, T.**, L. Duranti, and T. Playton, Estimating Micrite and Macroporosity Content in Carbonate Reservoir Rocks for Porosity-Permeability Analysis, *submitted to PETROPHYSICS*
- [56] Macente A.\*, **Vanorio T.**, Miller K.\*\*, Fousseis F., I. Buttler, (2019) Dynamic Imaging and Evolution of Permeability in Response to Chemo-Mechanical Compaction, *J. GEOPHYS. RES. SOLID EARTH*, doi: [10.1029/2019JB017750](https://doi.org/10.1029/2019JB017750)
- [55] **Vanorio T.**, MacFarlane J.\*, and A. Clark\*\*, The Alchemies of Lime, Alkali, and Sulfur in Forming Concrete-Like Rocks in Calderas, *Under Revision FRONTIERS EARTH-SCI*
- [54] Suwannasri K\*., and **Vanorio T.**, A. Clark\*\* (2019), Data-Driven Elastic Modeling of Organic-Rich Marl During Maturation, *GEOPHYSICS*, doi:[10.1190/geo2018-0883.1](https://doi.org/10.1190/geo2018-0883.1)
- [53] Suwannasri K\*., and **Vanorio T.**, A. Clark\*\*, (2018) Monitoring the Changes In The Microstructure, Elastic And Transport Properties of Eagle Ford Marl Caused By *Ex-Situ* Maturation, *GEOPHYSICS*, 83 (5): MR263-MR281, doi: [10.1190/geo2017-0797.1](https://doi.org/10.1190/geo2017-0797.1)
- [52] Head D.\*, **Vanorio T.**, Clark A.\*\*, (2018) Elastic Softening of Limestone Upon Decarbonation with Episodic CO<sub>2</sub> Release. *J. GEOPHYS. RES. SOLID EARTH*, 123, doi: [10.1029/2018JB015733](https://doi.org/10.1029/2018JB015733)
- [51] Miller K\*\*., **Vanorio T.**, Yang S., Xiao X., (2018) A Scale-Consistent Method for Imaging Porosity and Micrite in Dual-Porosity Carbonate Rocks, *GEOPHYSICS*, DOI: [10.1190/geo2017-0812.1](https://doi.org/10.1190/geo2017-0812.1)
- [50] Clark A\*\*, MacFarlane J.\*, and **Vanorio T.**, (2018) Permeability evolution of a cemented volcanic ash during carbonation and CO<sub>2</sub> depressurization, *J. GEOPHYS. RES. SOLID EARTH*, 123, doi: [10.1029/2018JB015810](https://doi.org/10.1029/2018JB015810)
- [49] David C., J Wassermann, F Amann, J Klaver, C Davy, J Sarout, L Esteban, E H Rutter, Q Hu, L Louis, D A Lockner, A P S Selvadurai, **T Vanorio**, A Amann Hildenbrand, P G Meredith, J Browning, T M Mitchell, C Madonna, J Billiotte, T Reuschlé, D Lasseux, J Fortin, R Lenormand, D

- Loggia, F Nono, G Boitnott, E Jahns, M Fleury, G Berthe, P Braun, D Grégoire, L Perrier, P Polito, Y Jannot, A Sommier, B Krooss, R Fink, A Clark, (2018) KG<sup>2</sup>B, a collaborative benchmarking exercise for estimating the permeability of the Grimsel granodiorite — Part 2: modeling, microstructures and complementary data, *GEOPHYS. J. INT.*, 215, 2, 825–843, doi: [10.1093/gji/ggy305](https://doi.org/10.1093/gji/ggy305)
- [48] David C., J Wassermann, F Amann, D A Lockner, E H Rutter, **T Vanorio**, A Amann Hildenbrand, J Billiotte, T Reuschlé, D Lasseux, J Fortin, R Lenormand, A P S Selvadurai, P G Meredith, J Browning, T M Mitchell, D Loggia, F Nono, J Sarout, L Esteban, C Davy, L Louis, G Boitnott, C Madonna, E Jahns, M Fleury, G Berthe, P Delage, P Braun, D Grégoire, L Perrier, P Polito, Y Jannot, A Sommier, B Krooss, R Fink, Q Hu, A Clark, (2018) KG<sup>2</sup>B, a collaborative benchmarking exercise for estimating the permeability of the Grimsel granodiorite – Part 1: measurements, pressure dependence and pore-fluid effects, *GEOPHYS. J. INT.*, 215, 2, 799–824, doi: [10.1093/gji/ggy304](https://doi.org/10.1093/gji/ggy304)
- [47] **Vanorio T.**, 2018, Challenges and Recent Advances in Rock Physics, *SEG International Geophysical Conference Expanded Abstracts*, 1290-1292, doi: [seg\\_IGC2018-316](https://doi.org/seg_IGC2018-316).
- [46] Suwannasri K\*, **T. Vanorio**, and A.C. Clark\*\*, 2018, Data-driven elastic modeling of organic-rich marl during maturation, *SEG Technical Program Expanded Abstracts 2018*, 3473-3477, doi: [seg\\_segam2018-2995177.1](https://doi.org/seg_segam2018-2995177.1).
- [45] Wollner U.\* and **T. Vanorio**, A. Kiss, (2017) Can Rock Microstructures Exhibit An Auxetic Behavior? *Int. J. of Sol. Struct.*, 130-131; Journal Issue: C; Journal ID: ISSN 0020-7683
- [44] Miller K.\*\*, **T. Vanorio**, and Y. Keehm, (2017) Evolution of Permeability Due to Rock-Fluid Interaction: Numerically Simulated and Experimentally Measured Dissolution, *J. GEOPHYS. RES. SOLID EARTH*, 122, 4460–4474, doi: [10.1002/2017JB013972](https://doi.org/10.1002/2017JB013972).
- [43] El Husseiny A\*., and **T. Vanorio**, (2017) Porosity-Permeability Relationship in Dual-Porosity on of Carbonate Analogs, *GEOPHYSICS*, Vol. 82, No. 1, MR65-MR74, doi: [10.1190/GEO2015-0649.1](https://doi.org/10.1190/GEO2015-0649.1)
- [42] Suwannasri K.\*, **T. Vanorio**, and A.C. Clark\*\*, (2017), Monitoring the changes in elastic and transport properties of Eagle Ford marl upon maturation, *SEG Technical Program Expanded Abstracts 2017*, 3593-3597, doi: [seg\\_segam2018-2995167.1](https://doi.org/seg_segam2018-2995167.1).
- [41] Head D\*., and **T., Vanorio**, (2016) Experimental and Simulated Permeability of Controlled, 3D-Printed Rock Microstructures, *GEOPHYS. RES. LETT.*, 43, 7494–7502, doi: [10.1002/2016GL069334](https://doi.org/10.1002/2016GL069334), [Paper selected as an Editor’s Choice by the journal Science](#)
- [40] Clark A.\*\* and **Vanorio T.**, (2016) The rock physics and geochemistry of carbonates exposed to reactive brines, *J. GEOPHYS. RES. SOLID EARTH*, 121, 1497–1513, doi: [10.1002/2015JB012445](https://doi.org/10.1002/2015JB012445).
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- [36] **Vanorio T.**, and W. Kanitpanyacharoen\*\*, (2015) Rock Physics of Fibrous Rocks Akin to Roman Concrete Explains Uplifts at Campi Flegrei Caldera, *SCIENCE*, vol. 349 no. 6248 pp. 617-621. [Paper featured on the cover of Science](#)
- [35] **Vanorio, T.**, (2015) Recent Advances in Time-Lapse, Laboratory Rock Physics For The

- Characterization and Monitoring of Fluid-Rock Interactions, *GEOPHYSICS*, Vol. 80, No. 2, pp. WA49-WA59, [10.1190/GEO2014-0202.1](https://doi.org/10.1190/GEO2014-0202.1)
- [34] El Husseiny A.\* and **T. Vanorio**, (2015) Effect of Micrite Content on Velocity and Dissolution of Carbonate Analogs, *GEOPHYSICS*, Vol. 80, No. 4, pp. L45-L55, [10.1190/GEO2014-0599.1](https://doi.org/10.1190/GEO2014-0599.1)
- [33] Allan, A. \*, W. Kanitpanyacharoen\*, **Vanorio, T.**, (2015) A, Multiscale Methodology for the Time-Variant Analysis of Velocity Anisotropy in Organic-Rich Shale, *GEOPHYSICS*, 80, 4, C73-C88, [10.1190/GEO2014-0192.1](https://doi.org/10.1190/GEO2014-0192.1)
- [32] **Vanorio, T.**, Ebert, Y.\*\*\*, Grombacher, D.\* (2015) What Laboratory-Induced Dissolution Tell us About Natural Diagenetic Trends of Carbonate Rocks in Agar, S. M. & Geiger, S. (eds), *Fundamental Controls on Fluid Flow in Carbonates*. Geological Society of London & AAPG, Special Publications, 406 (v.4): 311-329
- [31] Allan A.M.\*, A. C. Clark\*\*, and **T. Vanorio**, (2015), Pyrolysis-Induced Evolution of the Elastic and Transport Properties of the Barnett Shale, *SEG Technical Program Expanded Abstracts 2015*. 3068-3073, [doi: seg-segam2015-5823323.1](https://doi.org/10.1190/seg-segam2015-5823323.1).
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- [29] Allan, A. \* M., **Vanorio, T.**, Dahl, J. E., (2014) Pyrolysis-induced P-wave velocity anisotropy in organic-rich shales, *GEOPHYSICS* 2014; 79 (2): D41–D53, [10.1190/GEO2013-0254.1](https://doi.org/10.1190/GEO2013-0254.1)
- [28] Grude S.\*, J. Dvorkin, A. Clark\*\*, **T. Vanorio** and M. Landrø, (2013) Pressure effects caused by CO<sub>2</sub> injection in the Snøhvit Field First Break, *GEOPHYSICS*, Vol. 31, 12, DOI: 10.3997/2214-4609.20131604.
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