

# Mathieu Bauchy

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## Education

2009-2012 **Ph.D. - Université Pierre et Marie Curie (UPMC), Paris, France**

*Topological constraints and rigidity transitions in glasses*

Advised by Prof. Matthieu Micoulaut

2006-2009 **Master - Complex Systems - École Normale Supérieure de Cachan / UPMC**

*European Graduate Degree of statistical physics*

2007-2008 **Physics and chemistry “Agrégation” - École Normale Supérieure de Cachan**

*Fifth year of university study in preparation for teaching in French high schools*

2006-2007 **License - Fundamental Physics - École Normale Supérieure de Cachan / UPMC**

*Undergraduate studies, admission after competitive exam*

## Research awards

2014 **Future Leader in the Ceramics and Glass Industry nomination**

*Young professional nomination attributed by The American Ceramic Society*

2012 **Norbert J. Kreidl Award**

*Young scholar award (glass science) attributed by The American Ceramic Society*

## Technical skills

Programing      Fortran, C/C++, Python, LATEX

Web                PHP, MySQL, HTML, CSS, Ajax

Software        Matlab, R, Maple, IDL, Xmgrace

OS                Mac-OS X / Linux / Windows

Simulations     Classical (DL\_POLY, LAMMPS) and *ab initio* (CPMD) MD

## Research experience

- From 2014 **Assistant professor – University of California, Los Angeles, CA, US**  
*Civil and Environmental Engineering Department*
- 2012-2014 **Postdoctoral Associate – MIT, Cambridge MA, US**  
*Topological nano-engineering of concrete*  
In the team of Dr. Roland Pellenq and Prof. Franz-Joseph Ulm
- 2009-2012 **Ph.D. student – Université Pierre et Marie Curie (UPMC)**  
*Topological constraints and rigidity transitions in glasses*  
Advised by Prof. Matthieu Micoulaut
- 2009 **Master Research internship – LPTMC, UPMC, Paris, France**  
*Diffusion and rigidity in silicates glasses*  
Supervised by Prof. Matthieu Micoulaut
- 2007 **Master Research internship – ESSCC, U. of Queensland, Australia**  
*Geophysics – Subduction areas: modeling and simulation*  
Supervised by Prof. Hans Muhlhaus
- 2006 **License Research internship – LERMA, Obs. de Paris, France**  
*Data analysis – Calibration tests for the Planck satellite*  
Supervised by Dr. Alain Coulais

## Teaching

- From 2014 **Assistant Professor – UCLA**  
*Mechanics of deformable materials (CEE 108)*  
*Structure & Properties of Amorphous Civil Engineering Materials (CEE C105/205)*  
*Modeling & Simulation of Civil Engineering Materials (CEE 206)*  
*Civil and Environmental Engineering Graduate Seminar (CEE 200)*
- 2009-2012 **Teaching assistant – UPMC**  
*Mechanical, acoustic and electromagnetic waves, undergraduate course (L2)*  
*Lectures, tutorials, and workshop activities*
- 2008-2009 **Physics/Chemistry mentoring assistant – Lycées Marcelin Berthelot/Hoche**  
*Mentored 90 undergraduate students to prepare for competitive exams*
- 2007 **Teaching internship in scientific high school – Lycée Marcelin Berthelot**  
*Provided lecturing and workshop activities for a group of 30 students*
- 2005 **Founder of the company “BlueBiz”**  
Founded a company that provides web educational resources, still in activity

## Scientific communications

- Dec. 2016 *Understanding the effect of irradiation on concrete (talk, invited)*  
GDRI M2UN Annual Meeting, Paris, France
- Oct. 2016 *Irradiation-induced damage in minerals (talk, invited)*  
MS&T 2016, Salt Lake City, USA
- July 2016 *Origin of the thermometer effect in glasses (talk, invited)*  
Conference on Non-Crystalline Materials 13, Halifax, Canada
- June 2016 *Towards the design of unbreakable glasses (poster)*  
2016 Glass Research Summit, Corning, USA
- May 2016 *Structural signature of irradiation damage in glass (talk, invited)*  
Glass & Optical Materials Division Annual Meeting, Madison, USA
- May 2016 *Room temperature relaxation of glass (talk, invited)*  
Glass & Optical Materials Division Annual Meeting, Madison, USA
- March 2016 *Topological control on silicates' dissolution (talk)*  
IGCMAT, Los Angeles, USA
- Jan. 2016 *Nano-Ductility in Silicate Glasses (talk, invited)*  
40<sup>th</sup> ICACC, Daytona, USA
- Dec. 2015 *Stretched Exponential Relaxation of Glasses (talk, invited)*  
7th Meeting on Molecular Simulations, Mexico City, Mexico
- Oct. 2015 *Irradiation-induced damage in quartz (talk, invited)*  
MS&T 2015, Columbus, USA
- Sep. 2015 *Understanding concrete creep through glass science (talk, invited)*  
CONCREEP-10, Vienna, Austria
- Aug. 2015 *Radiation-induced rigidity transition in quartz (talk, invited)*  
XXIV International Materials Research Congress, Cancun, Mexico
- June 2015 *Fracture toughness of silicates: Topology matters (talk)*  
Engineering Mechanics Institute Conference, Stanford, USA
- May 2015 *Nano-Ductility and topological heterogeneity in silicate glasses (talk)*  
Glass & Optical Materials Division Annual Meeting, Miami, USA
- Nov. 2014 *Extension of rigidity theory to complex materials (talk, invited)*  
2014 MRS Fall Meeting, Boston, USA
- June 2014 *Aging and mechanical properties prediction (talk, invited)*  
2014 Glass Research Summit, Corning, USA

- May 2014 *Topological constraints and reactivity of calcium aluminosilicates (talk)*  
Glass & Optical Materials Division Annual Meeting, Aachen, Germany
- May 2014 *Percolative heterogeneous topological constraints in liquids (talk)*  
Glass & Optical Materials Division Annual Meeting, Aachen, Germany
- March 2014 *Is cement a glassy material? (talk)*  
Euro-C 2014, St. Anton am Arlberg, Austria
- Jan. 2014 *Improving the fracture toughness from atomic-scale modeling (talk)*  
38<sup>th</sup> ICACC, Daytona, USA
- Sept. 2013 *Mastering the composition dependence of the creep in cement (talk)*  
CONCREEP-9, Boston, USA
- Aug. 2013 *Predicting the mechanical properties of cement versus composition (talk)*  
Engineering Mechanics Institute Conference, Evanston, USA
- July 2013 *Rigidity transition in cement (talk)*  
4<sup>th</sup> Advances in Cement-based Materials, Urbana-Champaign, USA
- May 2013 *Topological constraints: from silicate glasses to cement (talk, invited)*  
Pacific Rim Conference on Ceramic and Glass Technology, San Diego, USA
- July 2012 *Structure, topology and dynamics of As-Se semiconductor systems (talk)*  
International Symposium on Non-Oxide and New Optical, St. Malo, France
- May 2012 *Norbert J. Kreidl award lecture (talk, invited)*  
Glass & Optical Materials Division Annual Meeting, St. Louis, USA
- May 2012 *Topological constraints and rigidity of network glasses (talk, invited)*  
Glass & Optical Materials Division Annual Meeting, St. Louis, USA
- Feb. 2012 *Topological Constraints in glassy networks: predicting aging (talk)*  
Aging of Engineering Materials workshop, Zurich, Switzerland
- Oct. 2011 *Densified sodium silicates: diffusion and viscosity (talk)*  
9th Silicate Melts Workshop, La Petite Pierre, France
- Oct. 2011 *Densified sodium silicates: thermodynamics, structure and dynamics (poster)*  
9th Silicate Melts Workshop, La Petite Pierre, France
- June 2011 *Structure and coordination numbers of liquid As-Se systems (talk)*  
5th ICANC, Bucharest, Romania
- May 2011 *Distribution of temperature dependent topological constraints (talk)*  
Glass & Optical Materials Division Annual Meeting, Savannah, USA

- Nov. 2010 *Densified sodium silicates: structure and diffusion (poster)*  
Journées Verre 2010, Nancy, France
- July 2010 *Densified sodium silicates: diffusion (poster)*  
Conference on Non-Crystalline Materials 11, Paris, France
- May 2010 *Effect of the density on the structure and dynamics of sodium silicates (talk)*  
Glass & Optical Materials Division Annual Meeting, Corning, USA

## Publications

1. *Evidence for Anomalous Dynamic Heterogeneities in Isostatic Supercooled Liquids*, M. Bauchy, M. Micoulaut, **Physical Review Letters** (2017), in press
2. *Irradiation-Induced Topological Transition in SiO<sub>2</sub>: Structural Signature of Networks' Rigidity*, B. Wang, N.M.A. Krishnan, Y. Yu, M. Wang, Y. Le Pape, G. Sant, M Bauchy, **Journal of Non-Crystalline Solids** 463 (2017) 25-30
3. *Nanoengineering of Concrete via Topological Constraint Theory*, M. Bauchy, **MRS Bulletin** 42 (2017) 50-54
4. *Correlating the Network Topology of Oxide Glasses with their Chemical Durability*, N. Mascaraque, M. Bauchy, M. M. Smedskjaer, **The Journal of Physical Chemistry B** (2017), in press
5. *Structural Origin of High Crack Resistance in Sodium Aluminoborate Glasses*, K. Januchta, R. E. Youngman, A. Goel, M. Bauchy, S. J. Rzoska, M. Bockowski, M. M. Smedskjaer, **Journal of Non-Crystalline Solids** 460 (2017) 54-65
6. *Fragility and Configurational Heat Capacity of Calcium Aluminosilicate Glass-Forming Liquids*, T. K. Bechgaard, J. C. Mauro, M. Bauchy, Y. Yue, L. A. Lamberson, L. R. Jensen, M. M. Smedskjaer, **Journal of Non-Crystalline Solids** 461 (2017) 24-34
7. *Ion Exchange Strengthening and Thermal Expansion of Glasses: Common Origin and Critical Role of Network Connectivity*, M. Wang, B. Wang, N. M. A. Krishnan, Y. Yu, M. M. Smedskjaer, J. C. Mauro, G. Sant, M. Bauchy, **Journal of Non-Crystalline Solids** 455 (2017) 70-74
8. *Confined Water in Layered Silicates: The Origin of Anomalous Thermal Expansion Behavior in Calcium-Silicate-Hydrates*, N.M.A. Krishnan, B. Wang, G. Falzone, Y. Le Pape, N. Neithalath, L. Pilon, M. Bauchy, G. Sant, **ACS Applied Materials & Interfaces** 8 (2016) 35621-35627
9. *Reactive Molecular Dynamics Simulations of Sodium Silicate Glasses — Toward an Improved Understanding of the Structure*, Y. Yu, B. Wang, M. Wang, G. Sant, M. Bauchy, **International Journal of Applied Glass Science** (2016), in press
10. *Crucial Effect of Angular Flexibility on the Fracture Toughness and Nano-Ductility of Aluminosilicate Glasses*, M. Wang, B. Wang, T. K. Bechgaard, J. C. Mauro, S. J. Rzoska, M. Bockowski, M. M. Smedskjaer, M. Bauchy, **Journal of Non-Crystalline Solids** 454 (2016) 46-51
11. *Fracture Toughness Anomalies: Viewpoint of Topological Constraint Theory*, M. Bauchy, B. Wang, M. Wang, Y. Yu, M. J. Abdolhosseini Qomi, M. M. Smedskjaer, C. Bichara, F.-J. Ulm, R. Pellenq, **Acta Materialia** 121 (2016) 234-239
12. *Vertical Scanning Interferometry: A New Method to Quantify Re-/De-Mineralization*

- Dynamics of Dental Enamel*, I. Pignatelli, A. Kumar, K. Shah, M. Balonis, M. Bauchy, B. Wu, G. Sant, **Dental Materials** 32 (2016) e251-e261
13. *A Dissolution-Precipitation Mechanism is at the Origin of Concrete Creep in Moist Environments*, I. Pignatelli, A. Kumar, R. Alizadeh, Y. Le Pape, M. Bauchy, G. Sant, **The Journal of Chemical Physics** 145 (2016) 054701
  14. *Revisiting Silica with ReaxFF: Towards Improved Predictions of Glass Structure and Properties via Reactive Molecular Dynamics*, Y. Yu, B. Wang, M. Wang, G. Sant, M. Bauchy, **Journal of Non-Crystalline Solids** 443 (2016) 148-154
  15. *Effects of Thermal and Pressure Histories on the Chemical Strengthening of Sodium Aluminosilicate Glass*, M. N. Svenson, L. M. Thirion, R. E. Youngman, J. C. Mauro, M. Bauchy, S. J. Rzoska, M. Bockowski, M. M. Smedskjaer, **Frontiers in Materials** 3 (2016) 14
  16. *Topological Control on Silicates' Dissolution Kinetics*, I. Pignatelli, A. Kumar, M. Bauchy, G. Sant, **Langmuir** 32 (2016) 4434-4439
  17. *Misfit Stresses Caused by Atomic Size Mismatch: The Origin of Doping-Induced Destabilization of Dicalcium Silicate*, P. Guo, B. Wang, M. Bauchy, G. Sant, **Crystal Growth & Design** 16 (2016) 3124-3132.
  18. *The Influences of Soft and Stiff Inclusions on the Mechanical Properties of Cementitious Composites*, G. Falzone, G. Puerta Falla, Z. Wei, M. Zhao, A. Kumar, M. Bauchy, N. Neithalath, L. Pilon, G. Sant, **Cement and Concrete Composites** 71 (2016) 153-165
  19. *The Influence of Water Activity on the Hydration Rate of Tricalcium Silicate*, T. Oey, A. Kumar, G. Falzone, J. Huang, S. Kennison, M. Bauchy, N. Neithalath, J. W. Bullard, G. Sant, **Journal of the American Ceramic Society** 99 (2016) 2481-2492
  20. *Mesoscale Texture of Cement Hydrates*, K. Ioannidou, K. J. Krakowiak, M. Bauchy, C. G. Hoover, E. Masoero, S. Yip, F.-J. Ulm, P. Levitz, R. Pellenq, E. Del Gado, **Proceedings of the National Academy of Sciences** 113 (2016) 201520487
  21. *Nanoductility in Silicate Glasses is Driven by Topological Heterogeneity*, B. Wang, Y. Yu, M. Wang, J. Mauro, M. Bauchy, **Physical Review B** 93 (2016) 064202
  22. *Direct Experimental Evidence for Differing Reactivity Alterations of Minerals following Irradiation: The Case of Calcite and Quartz*, I. Pignatelli, A. Kumar, K. G. Field, B. Wang, Y. Yu, Y. Le Pape, M. Bauchy, G. Sant, **Scientific Reports** 6 (2016) 20155
  23. *Stretched Exponential Relaxation of Glasses at Low Temperature*, Y. Yu, M. Wang, D. Zhang, B. Wang, G. Sant, M. Bauchy, **Physical Review Letters** 115 (2015) 165901
  24. *Unique Effects of Thermal and Pressure Histories on Glass Hardness: Structural*

- and Topological Origin*, M. M. Smedskjaer, M. Bauchy, J. C. Mauro, S. J. Rzoska, M. Bockowski, **The Journal of Chemical Physics** 143 (2015) 164505
25. *Electronic Origin of Doping-Induced Enhancements of Reactivity: Case Study of Tricalcium Silicate*, J. Huang, B. Wang, Y. Yu, L. Valenzano, M. Bauchy, G. Sant, **The Journal of Physical Chemistry C** 119 (2015) 25991-25999
26. *The Influence of Filler Type and Surface Area on the Hydration Rates of Calcium Aluminate Cement*, G. Puerta-Falla, A. Kumar, L. Gomez-Zamorano, M. Bauchy, N. Neithalath, G. Sant, **Construction and Building Materials** 96 (2015) 657-665
27. *Sub-Critical Crack Growth in Silicate Glasses: Role of Network Topology*, M. M. Smedskjaer, M. Bauchy, **Applied Physics Letters** 107 (2015) 141901
28. *Cycling through the Glass Transition: Evidence for Reversibility Windows and Dynamic Anomalies*, B. Mantisi, M. Bauchy, M. Micoulaut, **Physical Review B** 92 (2015) 134201
29. *Direct Carbonation of Ca(OH)<sub>2</sub> Using Liquid and Supercritical CO<sub>2</sub>: Implications for Carbon-Neutral Cementation*, K. Vance, G. Falzone, I. Pignatelli, M. Bauchy, M. Balonis, G. Sant, **Industrial & Engineering Chemistry Research** 54 (2015) 8908-8918
30. *Nature of Radiation-Induced Defects in Quartz*, B. Wang, Y. Yu, I. Pignatelli, G. Sant, M. Bauchy, **The Journal of Chemical Physics** 143 (2015) 024505
31. *Intrinsic Nano-Ductility of Glasses: The Critical Role of Composition*, B. Wang, Y. Yu, Y. J. Lee, M. Bauchy, **Frontiers in Materials** 2 (2015) 11
32. *Densified Network Glasses and Liquids with Thermodynamically Reversible and Structurally Adaptive Behaviour*, M. Bauchy, M. Micoulaut, **Nature Communications** 6 (2015) 6398
33. *Rigidity Transition in Materials: Hardness is Driven by Weak Atomic Constraints*, M. Bauchy, M. J. A. Qomi, C. Bichara, F.-J. Ulm, R. J.-M. Pellenq, **Physical Review Letters** 114 (2015) 125502
34. *Fracture Toughness of Calcium–Silicate–Hydrate from Molecular Dynamics Simulations*, M. Bauchy, H. Laubie, M. J. A. Qomi, C. G. Hoover, F.-J. Ulm, R. J.-M. Pellenq, **Journal of Non-Crystalline Solids** 419 (2015) 58-64
35. *Structural, Dynamic, Electronic, and Vibrational Properties of Flexible, Intermediate, and Stressed Rigid As-Se Glasses and Liquids from First Principles Molecular Dynamics*, M. Bauchy, A. Kachmar, M. Micoulaut, **The Journal of Chemical Physics** 141 (2014) 194506
36. *Structural, Vibrational, and Elastic Properties of a Calcium Aluminosilicate Glass from Molecular Dynamics Simulations: The Role of the Potential*, M. Bauchy, **The Journal of Chemical Physics** 141 (2014) 024507



37. *Combinatorial Molecular Optimization of Cement Hydrates*, M.J. Abdolhosseini Qomi, K. J. Krakowiak, M. Bauchy, K. Stewart, R. Shahsavari, D. Jagannathan, D. Brommer, A. Baronnet, M. Buehler, K. Van Vliet, S. Yip, F.-J. Ulm, R. J.-M. Pellenq, **Nature Communications** 5 (2014) 4960
38. *Nanoscale Structure of Cement: The Viewpoint of Rigidity Theory*, M. Bauchy, M. J. Abdolhosseini Qomi, C. Bichara, F.-J. Ulm, R. J.-M. Pellenq, **The Journal of Physical Chemistry C** 118 (2014) 12485-12493
39. *Order and Disorder in Calcium–Silicate–Hydrate*, M. Bauchy, M. J. Abdolhosseini Qomi, F.-J. Ulm, R. J.-M. Pellenq, **The Journal of Chemical Physics** 140 (2014) 214503
40. *Anomalous Composition-Dependent Dynamics of Nanoconfined Water in the Interlayer of Disordered Calcium-Silicates*, M.J. Abdolhosseini Qomi, M. Bauchy, F.-J. Ulm, R. Pellenq, **The Journal of Chemical Physics** 140 (2014) 054515
41. *Percolative Heterogeneous Topological Constraints and Fragility in Glass-Forming Liquids*, M. Bauchy, M. Micoulaut, **Europhysics Letters** 104 (2013) 56002
42. *Structure, Topology, Rings, and Vibrational and Electronic Properties of Ge-Se Glasses across the Rigidity Transition: A numerical Study*, M. Micoulaut, A. Kachmar, M. Bauchy, S. Le Roux, C. Massobrio, M. Boero, **Physical Review B** 88 (2013) 054203
43. *Compositional Thresholds and Anomalies in Connection with Stiffness Transitions in Network Glasses*, M. Bauchy, M. Micoulaut, M. Boero, C. Massobrio, **Physical Review Letters** 110 (2013) 165101
44. *Transport Anomalies and Adaptive Pressure-Dependent Topological Constraints in Tetrahedral Liquids: Evidence for a Reversibility Windows Analogue*, M. Bauchy, M. Micoulaut, **Physical Review Letters** 110 (2013) 095501
45. *Anomalies of the First Sharp Diffraction Peak in Network Glasses: Evidence for Correlations with Dynamic and Rigidity Properties*, M. Micoulaut, M. Bauchy, **Physica Status Solidi (b)** 250 (2013) 976-982
46. *Structure of As<sub>2</sub>Se<sub>3</sub> and AsSe Networks Glasses: Evidence for Coordination Defects and Homopolar Bonding*, M. Bauchy, M. Micoulaut, **Journal of Non-Crystalline Solids** 377 (2013) 34-38
47. *Structure and Dynamics of Liquid AsSe<sub>4</sub> from ab initio Molecular Dynamics Simulation*, M. Bauchy, **Journal of Non-Crystalline Solids** 377 (2013) 39-42
48. *Viscosity and Viscosity Anomalies of Model Silicates and Magmas: A Numerical Investigation*, M. Bauchy, B. Guillot, M. Micoulaut, and N. Sator, **Chemical Geology** 346 (2013) 47-56

49. *Structural, Vibrational and Thermal Properties of Densified Silicates: Insights from Molecular Dynamics*, M. Bauchy, **The Journal of Chemical Physics** 137 (2012) 044510
50. *Topological Constraints and Rigidity of Network Glasses from Molecular Dynamics Simulations*, M. Bauchy, **American Ceramic Society Bulletin** 91 (2012) 34-38
51. *Angular Rigidity in Tetrahedral Network Glasses with Changing Composition*, M. Bauchy, M. Micoulaut, M. Celino, S. Le Roux, M. Boero, C. Massobrio, **Physical Review B** 84 (2011) 54201
52. *From Pockets to Channels: Density-Controlled Diffusion in Sodium Silicates*, M. Bauchy, M. Micoulaut, **Physical Review B** 83 (2011) 184118
53. *Atomic Scale Foundation of Temperature-Dependent Bonding Constraints in Network Glasses and Liquids*, M. Bauchy, M. Micoulaut, **Journal of Non-Crystalline Solids** 357 (2011) 2530-2537
54. *Dynamics of Slab Tear Faults: Insights from Numerical Modelling*, A. J. Hale, K. D. Gottschaldt, G. Rosenbaum, L. Bourgoïn, M. Bauchy, H. Muhlhaus, **Tectonophysics** 483 (2010) 58-70

## Conference proceedings

1. *Creep of Bulk C-S-H: Insights from Molecular Dynamics Simulations*, M. Bauchy, E. Masoero, F.-J. Ulm, R. Pellenq, CONCREEP 10 (2015) 511-516
2. *C-S-H across Length Scales: From Nano to Micron*, M. J. Abdolhosseini Qomi, E. Masoero, M. Bauchy, F.-J. Ulm, E. Del Gado, R. J.-M. Pellenq, CONCREEP 10 (2015) 39-48
3. *Kinetic Simulations of Cement Creep: Mechanisms from Shear Deformations of Glasses*, E. Masoero, M. Bauchy, E. Del Gado, H. Manzano, R. M. Pellenq, F.-J. Ulm, S. Yip, CONCREEP 10 (2015) 555-564
4. *Linking Fly Ash Composition to Performance in Cementitious Systems*, T. Oey, J. Bullard, P. Stutzmann, M. Zhao, A. Kumar, M. Bauchy, G. Sant, World of Coal Ash Conference (2015)
5. *Fracture Toughness of Silicate Glasses: Insights from Molecular Dynamics Simulations*, Y. Yu, B. Wang, Y. J. Lee, M. Bauchy, MRS Proceedings (2015)
6. *Applying tools from glass science to study calcium-silicate-hydrates*, M.J. Abdolhosseini Qomi, M. Bauchy, R. Pellenq, F.J. Ulm, Mechanics and Physics of Creep, Shrinkage, and Durability of Concrete (2013) 78

## Book chapters

1. *Polymorphism and Its Implications on Structure-Property Correlation in Calcium-Silicate-Hydrates*, M.J.A. Qomi, M. Bauchy, F.-J. Ulm, R. Pellenq, in "Nanotechnology in Construction", K. Sobolev, S. P. Shah, Springer (2015)
2. *Topological constraints, rigidity transitions and anomalies in disordered systems*, M. Micoulaut, M. Bauchy, H. Flores-Ruiz, in "Molecular Dynamics Simulations of Disordered Materials", C. Massobrio, J. Du, Springer (2015)
3. *Is cement a glassy material?*, M. Bauchy, M.J. Abdolhosseini Qomi, R. Pellenq, F.-J. Ulm, in "Computational Modelling of Concrete Structures", N. Bicanic, R. de Borst, H. Mang, G. Meschke, CRC Press (2014)

## Synergic activities

- Reviewer Journal papers: Applied Physics Letters, Journal of Chemical Physics, Journal of Non-Crystalline Solids, Structures and Buildings, Computational Materials Science, Journal of Applied Physics, Journal of the American Ceramic Society, Cement and Concrete Research, MRS Communications, Frontiers in Materials, Granular Matter, Nanoscale, Scientific Reports, Chemical Physics Letters, ACS Applied Materials & Interfaces, Physical Review B, Langmuir, Journal of Nanomechanics and Micromechanics, International Journal of Thermal Sciences, Materials and Design, Journal of Physical Chemistry, International Journal of Modern Physics B, International Journal of Applied Glass Science, Materials.  
Proposals: European Research Council (ERC), Department of Energy (DOE), ACS Petroleum Research Fund, Dutch Foundation for Fundamental Research on Matter (FOM)
- Editor Associate Editor for ASCE Journal of Materials in Civil Engineering (2016-) Review Editor for Frontiers in Materials, Nature Publishing group (2014-)
- Conferences Lead organizer for a session “Computational Design of Ceramics and Glasses” at the Materials Science & Technology conference, Salt Lake City UT (2017)
- Co-Organizer for a Session on “Nano- and micro-scale evolution of infrastructure materials under load, humidity, or radiation” at the Engineering Mechanics Institute Conference, San Diego CA (2017)
- Lead organizer for a session “Computational Design of Ceramics and Glasses” at the Materials Science & Technology conference, Salt Lake City UT (2016)
- Co-organizer for a session “Fluid-dependent mechanics of porous materials: a focus on the nanoscale” at the ASCE Engineering Mechanics Institute conference, Vanderbilt (2016)
- Co-organizer of the 1st International Conference on Grand Challenges in Construction Materials (IGCMAT), Los Angeles CA (2016)
- Co-organizer for a session “Advances in creep mechanics” at the ASCE Engineering Mechanics Institute International Conference, Metz, France (2016)
- Co-Organizer for a Session on “Formation, Ageing, and Failure of Cementitious Materials: Scale-Bridging Models and Insights from Glass Physics” at the Engineering Mechanics Institute Conference, Stanford CA (2015)
- Prof. Society Member of the American Ceramic Society (ACerS), American Society of Civil Engineers (ASCE), and Materials Research Society (MRS)

## Students and collaborators

### Advisees

#### Graduate students:

- (1) Shiqi Dong (Ph.D. 2020)
- (2) Yi-Hsuan Hsiao (Ph.D. 2019, ATC)
- (3) Yingtian Yu (Ph.D. 2018, ATC)
- (4) Sha Liu (M.S. 2017)
- (5) Peng Guo (Ph.D. 2017, ATC)
- (6) Mengyi Wang (M.S. 2016)

#### Postdoctoral scientists:

- (1) Dr. Anoop Krishnan (Ph.D. 2014 from IISc, India)
- (2) Dr. Bu Wang (Ph.D. 2012 from Alfred University, USA)

#### Undergraduate students:

- (1) Kai Yang (B.S. 2019)
- (2) Xin Li (B.S. 2018)
- (3) Weiyang Song (B.S. 2018)
- (4) Stephan Ahn (B.S. 2018)
- (5) Yushu Hu (B.S. 2017)
- (6) Yali Zheng (B.S. 2017)
- (7) Michael Gervasoni (B.S. 2017, now scientist at HRL Laboratories)
- (8) Zegao Liu (B.S. 2016)
- (9) Dawei Zhang (B.S. 2016, now Ph.D. student at Stanford)
- (10) Alex Young Jea Lee (B.S. 2015, now working as a Field Application Engineer at SK Hynix America Inc.)
- (11) Mengyi Wang (B.S. 2015, became M.S. student under my supervision)

#### Visiting Scholars:

- (1) Anne Kristine Fledelius Frederiksen (2017, M.S. student at Aalborg University)
- (2) Kacper Januchta (2016, now Ph.D. student at Aalborg University)
- (3) Dr. Yongqi Wei (2015, now professor in Tongji University, China)
- (4) Sandra Zin Win Maw (summer internship in 2015, now B.S. student at U.C. Berkeley)

### Collaborators

UCLA: G. Sant, M. Balonis, L. Pilon, J. R. DeShazo, B. Wu, K. Shah, J. Marian

Others: R. Alizadeh (Giatec Scientific), A. Baronnet (CNRS), C. Bichara (Marseille University), M. Bockowski (Polish Academy of Sciences), M. Boero (Strasbourg University), J. W. Bullard (NIST), M. J. Buehler (MIT), M. Celino (Italian National Agency for New Technologies), E. Del Gado (Georgetown University), L. Gomez-Zamorano (Universidad Autónoma de Nuevo León), B. Guillot (UPMC), Z. Grasley (TAMU), C. G. Hoover (ASU), J. Huang (Saint Gobain), A. Kachmar (Qatar Environment and Energy Research Institute), A. Kumar (MS&T), Y. Le Pape (ORNL), S. Le

Roux (Strasbourg University), P. Levitz (CNRS), E. Masoero (Newcastle University), C. Massobrio (Strasbourg University), H. Manzano (Basque Country University), J. C. Mauro (Corning Inc.), N. Mousseau (Montreal University), N. Neithalath (ASU), M. J. A. Qomi (UCI), S. J. Rzoska (Polish Academy of Sciences), L. M. Thirion (Corning Inc.), N. Sator (UPMC), M. M. Smedskjær (Aalborg University), L. Valenzano (MTU), K. J. Van Vliet (MIT), S. Yip (MIT), R. E. Youngman (Corning Inc.)