Emmanouela Filippidi

Assistant Professor (tenure track)
Department of Materials Science and Engineering
University of Crete

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Research interests: Experimental soft matter physics, biophysics, polyelectrolytes, proteins, phase separation and conformations in crowded environments, engineering tough elastomers

Academic Appointments

21.08.2025 -	Maternity leave
09.2020 - present	**Assistant Professor**, Department of Materials Science and Engineering, University of Crete
11.2020 - present	**Affiliated Faculty Member**, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, Crete
06.2021 - 05.2026	**Max Planck Society Partner Group Leader** in association with the Hyman lab at the MPI for Molecular Cell Biology and Genetics, Dresden
06.2021 - 08.2022	Maternity leave
10.2020 - 05.2021	Lockdown, online classes, no undergraduate students allowed at the University / FORTH
05.2019 - 09.2020	**Postdoctoral Scholar**, MPI for Molecular Cell Biology and Genetics and **visiting scientist**, MPI for the Physics of Complex Systems, Dresden. Advisors: Anthony A. Hyman and Frank Jülicher. *"The role of sequence in biomolecular phase separation"*
07.2016 - 06.2018	**Otis Williams Postdoctoral Scholar in Bioengineering**, Dept. of Mechanical Engineering and Materials Research Laboratory (MRL), University of California, Santa Barbara, CA. Independent project on *"Novel biocompatible but non-biodegradable medical adhesives"*. Starting point: coacervation of peptide-mimetic polyelectrolytes.
05.2014 - 06.2018	**Postdoctoral Scholar**, Materials Research Laboratory (MRL), University of California, Santa Barbara, CA. *Structure and mechanics of adhesive, byssal mussel plaques*, *design of supramolecular tough mussel-inspired elastomers* Advisor: Prof. Megan T. Valentine

Education

09.2007 - 05.2014	**Ph.D. in Physics**, Center for Soft Matter Research, New York University, New York, NY *Random Organization: Out-of-equilibrium phase transitions in periodically driven suspensions.* Advisor: Prof. David J. Pine. Committee: P. Chaikin, A. Grosberg, A. Donev, J. Morris
09.2005 - 09.2007	**Master of Science**, Dept. of **Biomedical Engineering**, Boston University, Boston, MA *Thesis: Controlled biopolymer assembly in microfluidic devices.* Advisor: Prof. Joyce Y. Wong
09.2001 - 06.2005	**Bachelor of Science in Engineering**, Cum Laude, Harvard University, Cambridge, MA *Thesis: Protein preservation in sugar glasses.* Advisor: Prof. Mehmet Toner
06.2001	**Apolytirio**, Athens College, Greece (19.6 / 20)

Teaching

Spring 2023-2025	**Mathematics II** - Integral and Vector Calculus (1st year) – Uof Crete
Spr '21, F '22-'24	**Transport Phenomena** - Heat, Mass, Momentum (3rd year) – Uof Crete
Fall 2020	**Introduction to Materials Science** (1st year, co-teaching) – Uof Crete
Fall 2020	**Soft Matter Lab** - thermal properties (3rd year, co-teaching) – Uof Crete
2008–2009	**Instructor of Record**, Laboratory class; grading; final grade assignment
Fall	Physics III laboratory (**Electricity-Magnetism-Optics**), New York University
Spring	Physics II laboratory (**Mechanics**), New York University
Fall 2007	Teaching Fellow, **General Physics I (Mechanics)**. New York University.
Fall 2006	Teaching Fellow, Introduction to **Fluid Mechanics**. Boston University.
09/2002–06/2005	**On-Call Peer Tutor**, Bureau of Study Counsel, Harvard University. Tutoring undergraduates in mathematics and physics: linear algebra, differential equations, complex analysis, mechanics.

Professional Affiliations

2021–present	European Colloid and Interface Society
2009–2021	American Physical Society
2015–2018	Biophysical society
2017–2018	Adhesion Society

Service

Co-editor Aug. 2025 –	*Frontiers in Molecular Biosciences*, issue "Advances in Protein Structure Biology – Use of AI" "and Beyond"
Referee (2016–present)	for *Nature Communications*, *Angewandte Chemie*, *Macromolecules*, *Soft Matter*, *ACS Applied Materials & Interfaces*, *ACS Chemistry of Materials*, *RSC's Polymer Chemistry*, *Macromolecular Rapid Comm.*, *Journal of Rheology*, *Polymers* and *Marine Drugs*.
ISMC 2025	Organizing Committee – 9th **International Soft Matter Conference**, Crete, 29.09.2025
Biophysics School	Co-organizing with Eleni Katifori (UPenn) and Dimitris Vavylonis (Lehigh) the 1st (08.2023) and 2nd (07.2025) **Biophysics Summer School**, Rethymno, Crete. https://biophysics.materials.uoc.gr. Lecturing, scientific program, accounting, website
ECIS 2024	Scientific Committee and Chair – **"Polymers, Polyelectrolytes, Gels, and Ionic Liquids"** 38th Conference of the European Colloid & Interface Society, Copenhagen, 01-06.09.2024
ECIS 2022	**Local Organizing Committee** – 36th Conference of the ECIS, Chania, Greece, 04-09.09.2022 Website supervision, Art of Science contest, 2023 ECIS Calendar design and distribution
Gordon GRS	**Discussion leader** for the Gordon Research Seminar on the Science of Adhesion, Mount Holyoke College, South Hadley, MA, 07.2015
2006, 2010–2012	Elected board member at the **Hellenic Bioscientific Association of the USA**
2002–2004	Treasurer and then President of **Harvard Hellenic Society**
Departmental	Outreach Committee 2020-25, Website Launch Committee 2020-2023
University	Voted UoC faculty representative to the Hellenic Federation of Univ. Faculty Associations. 2021 – 2022

Mentoring

Post-doc	**Stelios Alexandris**,"Tough dry elastomers" (10.2020 - 05.2021, FORTH-IESL). Currently Research Associate at Chem. Eng., KU Leuven with Prof. Christian Clasen.
Master's	**Yurley S. Pinto Morantes**, "Bio-based epoxy networks". Univ. of Rouen student (03.2025 - 09.2025 expected)
	Ioannis Sampson, "From polyelectrolyte to protein phase separation" (10.2022 – 12.2024)
Ph.D. committee	Nikolaos Burger, Athanasios Athanasiou (Materials Sci.); Andriani Mentzelopoulou (Biology) Arcangela Russo (UoCrete / UCLouvain), Teresiana Guarino (UoCrete / U. Montpellier)s
iGEM team	Scientific mentor and administrative/financial supervisor to the undergraduate iGEM team of the University of Crete. Silver medal. (03.2023 – 12.2023)
Undergraduate	**Nektaria Bolanaki** (UoC, Materials Sci.), Networks with multi-functional cross-linkers.
@ UoC	**Christina Chatzichrysou** (UoC, Biology), MeCP2's propensity for phase separation.
	(10.2023-10.2024) Next step: Erasmus+ with Sina Wittman, IMB, Mainz, Germany
	Triantafyllos Siamanis (UoC, Materials Sci.), Prep for PGL-3 smFRET (10.2023 – 12.2024)
	Eleni Manolia (UoC, Materials Sci.), Tough dry polymer Networks (11.2022 – 12.2023)
	Ioannis Sampson (UoC, Materials), Quantifying mussel plaque porosity 09.2021 – 06.2022
	Athina Karasavvidi (Materials Sci.) Stress granule formation in HeLa cells (Erasmus with Jik Nijssen, Hyman lab). (01.2021 – 12.2021). Now MS student at TU Dresden & MPI-CBG.
@ UCSB	**Justin Bernstein**, Mussel byssal maturation (2018). Our work was published in *Soft Matter*. Funding: UCSB SURF. Currently Product Manager, RTRS Technologies.

Chandler G. Bartz, Mussel plaque formation and maturation (06.2016 – 05.2018). Attended the 2018 APS March Meeting. Funding: UCSB RISE. Currently, Mechanical Engineering Designer at Northrop Grumman.

Grant Antalek Automated system for imaging plaque formation (05.2015 – 05.2016). Currently, Plant Manager at Henkel.

Noah Rubin Decoupling mussel plaque-thread mechanics (09.2014 – 05.2015). Funding: UCSB RISE. After a PhD (UNC-Chapel Hill), now Staff Scientist at NIH.

@ NYU **Sean Paradiso**, a summer REU UMass Amherst student (06 – 08.2008). Sean went on to receive his PhD in Chemical Engineering from UCSB / Fredrickson group.

Activities

Open Innovation **Finalist**, Confluence Challenge, an Open Innovation challenge brought together by industry (Alumil, Isomat and Kleeman), CERTH Research Center, and partners. https://confluence-challenge.net. Challenge: **System to temporarily protect painted surfaces**, with Alumil. Single finalist on this Challenge. Thessaloniki, Sept – Dec 2023.

SAXS/SANS Attended the Practical EMBO Course **Small angle neutron and X-ray scattering from biomacromolecules in solution**, ILL, Grenoble, France. 06.2022

Founder Co-founded DFHealth S.A., a medical device distribution company in Buenos Aires, Argentina. Local clinical trials with InnoSEAL Plus, a surgical pad accelerating wound closures of InnoTherapy, a Korean company. 2017-2020

Industry - Intern **Unilever R&D**, Department of Food Structural Design, Vlaardingen, Netherlands. Investigated water-in-oil emulsions for food structuring and synthesized oil core - zein shell particles for food and cosmetic applications. Supervision Dr. Krassimir Velikov. 06 –08.2010

Synchrotron course Attended the 4-week HERCULES theoretical and experimental course on **Synchrotron Radiation for Condensed Matter Studies** at ESRF and Soleil synchrotrons and ILL neutron source, France. 03.2007

Visiting student Max Planck Institute for Dynamics and Self-Organisation, Göttingen, Germany. Collagen I assembly via hydrodynamic focusing and in situ, real-time X-ray investigation of collagen packing. Advisor: Prof. Thomas Pfohl. 07–08.2006

Visiting student Polymer Group, Foundation for Research and Technology Hellas (FORTH), Heraklio, Greece. Determined the size-dependence of particle Brownian diffusion close to a polymer brush by evanescent wave dynamic light scattering. 06-08.2005

Undergraduate research Harvard Research Experience for Undergraduates (REU). Study of the rheological behavior of collagen I gels and the mechanical properties of expanding glioblastoma tumors in collagen I gels. Supervisors: Clifford Brangwynne, Vernita Gordon and Laura Kaufman, under the supervision of Prof. David A. Weitz, Cambridge, MA. 06.2003-05.2004

Summer School Attended the **Computing Beyond Silicon Summer School**, California Institute of Technology, Pasadena, CA. Month-long program consisting of lectures on DNA, molecular, quantum and nanoscale computing. Team project of our choice on "Stereovision and Synchronization of Spiking Neurons". 06.2004

Extern **Shadowed** breast cancer removal (Atlanta, GA, 03/2004) and vascular **surgeries** (Athens, Greece, 07.2001) as part of career exploration programs.

Grants, Awards, Fellowships

MPG Partner Group Leader	Max Planck Society Partner Group Leader with host institute the MPI of Molecular Cell Biology and Genetics, Dresden and FORTH-IESL, Crete. (€100k for 5 years) 06.2021 – 05.2026
MOLSPECOND	FORTH Synergy grant with Matthieu Lavigne (FORTH-IMBB) as co-PI for exploration of *in vivo* protein condensation with optogenetics experiments. (€80k for 2 years) 11.2023 – 10.2025
ToughNet	"Designing Superior Tough and Dry Polymer Networks", University of Crete peer-reviewed Start-Up grant (€15k for 2 years). Score 92/100. (12.2022-12.2024)
nanoCT @ KIT	User proposal "Adhesive marine mussel plaques: quantification of three-dimensional pore connectivity, size and shape" via nano computer tomography at the Karlsruhe Nano Micro Facility (KNMFi) of KIT. Measured Jan. 2023.
Networks	"Polymer networks with improved mechanical properties" by Ministry of Development, hosted at FORTH-IESL. Collaborator: Prof. D. Vlassopoulos. (€47,000 for 15 months) employing Dr. Alexandris and Dr. Moghimi. 06.2020-08.2021
ESRF	BM29 BioSAXS proposal "Disordered protein conformation upon crowding and phase separation" MX-2718 accepted and scheduled for 23.04.2025
EUSMI	European Soft Matter Infrastructure (EUSMI) proposal "Ageing and slow dynamics of bulk biomolecular condensates" for feasibility study of ageing via multi-speckle dynamic light scattering at FORTH, Crete (E190800325). 09.2019
Poster Award	Springer Poster Award, European Polymer Congress for *"Tough polymer networks with covalent and catechol-iron coordination bonds: correlation of binding stoichiometry with mechanical performance"* by Filippidi E., Palles D., Cristiani T.R., Eisenbach C.D., Kamitsos E.I. 06.2019
Post-doctoral Fellowship	Otis Williams Postdoctoral Fellowship in Bioengineering from the Santa Barbara Foundation for supporting the project "Novel Biocompatible but Non-Biodegradable Medical Adhesives" ($150k). 07.2016-07.2018
Thesis Award	Doctoral Thesis Award of the Circle of Hellenic Academics in Boston ($1000). 05.2016
Travel grant	Dow Materials institute & MRL Travel Fellowship to attend the APS March Meeting. 03.2016
Fellowship	Alexander S. Onassis Foundation fellowship for four years of graduate studies. 2009–2012
Scholarship	Eleni Gatzoyiannis Scholarship for graduate studies, Boston University. 2007
Presentation	Presentation award. MRSEC REU conference, Univ. Southern Mississippi. 2005
Career Grant	Harvard College Research Grant and Radcliffe externship for career exploration. 2003–2004
Intercultural	Certificate of Recognition, Harvard Foundation for Intercultural and Race Relations. 2005
Alumni Award	Parents' Award to recent alumni, Athens College. 2002

Invited Presentations

13. "From microstructure to macroscopic mechanics of adhesive marine mussel plaques." **KNMFi User Meeting** Karlsruhe Nano Micro Facility of KIT, Ettlingen, Germany. Nov. 2024
12. "Self-assembly and emergent behaviors in polymer and protein networks." Université de Rouen, in the framework of collaborations within the **Ingenium Alliance of European Universities**, Rouen, France. October 2024.
11. "Mussels: an inspiration for adhesives and beyond." **Student Symposium on Marine Bioinspiration**, 2nd year class "Unexpected Potentials of Marine Resources" of Science, Conservation and Valorization of Marine Resources Master's Program, Université Côte d'Azur, Nice, France, November 2022
10. "Networks with covalent and metal-coordination cross-links." **Summer School on 'Double Dynamics for design of new responsive polymer networks and gels'**, DodyNet Initial Training Network, Capri, July 2019
9. "From mussel adhesion to novel materials: toughening elastomers with mussel-inspired metal coordination complexes." **Institute of Nanoscience and Nanotechnology of NCSR 'Demokritos'**, Athens, February 2019
8. "From mussel adhesion to novel materials: toughening elastomers with mussel-inspired metal coordination complexes." **National Hellenic Research Foundation**, Athens, November 2018

7. "From mussel adhesion to novel materials: toughening elastomers with mussel-inspired metal coordination complexes." **Department of Materials Science and Technology**, University of Crete, Heraklio, October 2018
6. "Toughening elastomers using covalent and mussel-inspired metal coordination complexes." **Polymat seminar**, University of the Basque Country, Donostia-San Sebastián, April 2018
5. "Controlling toughness and dynamics of polymer networks via mussel-inspired dynamical bonds." **APS March Meeting**, New Orleans, March 2017
4. "From mussels to mussel-inspired materials." **Soft Matter Symposium**, Univ. of Florida, Gainesville, Oct 2016
3. "Random Organization : from reversibility to irreversibility in non-Brownian sheared suspensions." Workshop on flow of granular materials, **Centro Argentino-Frances de Ciencias de la Ingenieria** (CAFCI), Buenos Aires, September 2016
2. "Random Organization : from reversibility to irreversibility in non-Brownian sheared suspensions." **Physics Department, Harvard University**, Cambridge, MA, May 2016
1. "Critical phenomena in periodically-sheared suspensions." **Chaos, Complexity and Transport Conference**, Marseille, France, May 2011

Contributed Conference Presentations

28. **Filippidi E.**, Sampson I., McCall P. *"Enrichment of higher charge density species in polyelectrolytic complex coacervates"* (poster), 19th Dresden Polymer Discussion, Biomolecular Condensates and Polymer Phase Transitions, Meissen, Germany, May 2025
27. **Filippidi E.**, Li B., Vlassopoulos D. *"Mechanics of networks with two types of bonds: the effect of polymer crystallinity"* (talk) Self-Assembly session, ECIS 2024, 38th Conference of the European Colloid & Interface Society, Copenhagen, Sept. 2024
26. **Filippidi E.**, Sampson I., McCall P., Pozniakovsky A., Hyman A.A. *"Conformational changes of PGL-3 upon crowding and phase separation"* (poster) Gordon Research Conference on Biophysics and Biology of Intrinsically Disordered Proteins, Les Diablerets, Switzerland, June 2024
25. **Filippidi E.**, Sampson I., McCall P., Pozniakovsky A., Hyman A.A. *"Conformational changes of PGL-3 upon crowding and phase separation"* (poster) LeadNet Symposium, Max Planck Society, Harnack House, Berlin, Germany, Sept. 2024.
24. **Filippidi E.**, DeMartini D.G., Sampson I., Valentine M.T. *"Estimating the porosity of marine mussel adhesive plaques"* (poster) BioINSP 2022, 6th International School and Conference on Biological Materials Science, Kostenz, Germany, March 2022 (hybrid)
23. **Filippidi E.**, Jülicher F., Hyman A.A., *"Experimental determination of binodal compositions of protein and peptide solutions"* (talk) APS March Meeting, Denver, CO, March 2020 (online session due to COVID-19 cancellation)
22. **Filippidi E.**, Palles D., Cristiani T.R., Eisenbach C.D., Kamitsos E.I. *"Tough polymer networks with covalent and catechol-iron coordination bonds: correlation of binding stoichiometry with mechanical performance"* (poster) European Polymer Congress EPF, Hersonissos, Greece, June 2019
21. **Filippidi E.**, Patterson A., Danielsen S., Eisenbach C., Fredrickson G., Segalman R., Valentine M.T. *"Effect of Charge Density and Topology on Polyelectrolyte Complex Coacervation"* (talk) APS March Meeting, Los Angeles, CA, March 2018
20. Bartz C.G., DeMartini D., Waite J.H., **Filippidi E.**,Valentine M.T. *"Effects of physical parameters on structural maturation of marine mussel adhesive plaques"* (poster) APS March Meeting, Los Angeles, CA, March 2018
19. **Filippidi E.**, DeMartini D.G., Bartz G.C., Valentine M.T., Waite J.H., *"Effect of seawater pH and composition on the structural maturation of marine mussel adhesive plaques."* (talk) 6^{th} World Congress and 41^{st} Annual Meeting of the Adhesion Society, San Diego, CA, February 2018
18. **Filippidi E.**, Patterson A.L., Davidson E.C., Wonderly W.R., Waite J.H., Segalman R.A., Valentine M.T. *"The effect of charge density on peptoid coacervation."* (poster) 10^{th} Peptoid Summit, Lawrence Berkeley National Laboratory, July 2017
17. **Filippidi E.**, Cristiani T., Eisenbach C., Ahn B.K., Waite J.H., Israelachvili J.N., Valentine M.T. *"Toughening elastomers using mussel-inspired catechol-metal coordination complexes."* APS March Meeting (talk) and US-Brazil Young Physicists Forum (poster). Baltimore, MD, March 2016
16. **Filippidi E.**, DeMartini D.G., Malo de Molina P., Danner E.W, Kim J., Helgeson M.E., Waite J.H. and Valentine M.T., *"The mussel attachment plaque: a load-bearing protein scaffold."* (talk) Biophysical Society Annual Meeting, Los Angeles, CA, February 2016

15. **Filippidi**, DeMartini D.G., Waite J. H., Valentine M.T. *"The adhesive mussel plaque as a force distribution mechanism."* (poster) Materials Research Outreach Program Symposium, MRL, UC Santa Barbara, February 2016
14. **Filippidi E.**, DeMartini D., Malo de Molina P., Danner E.W, Kim J., Helgeson M.E., Waite J.H. and Valentine M.T., *"Mussels: an inspiration for underwater glue. The microscopic structure of adhesive plaques."* Gordon Research Seminar (talk) and Gordon Research Conference (poster) on Science of Adhesion, Mount Holyoke College, South Hadley, MA, July 2015
13. **Filippidi E.**, DeMartini D., Malo de Molina P., Ewert K., Danner E.W, Kim J., Eisenbach C., Helgeson M.E., Waite J.H., Valentine M.T., *"Novel view: the adhesive mussel plaque as a porous material."* NSF MRSEC site visit to UC Santa Barbara, May 2015
12. **Filippidi E.**, DeMartini D., Danner E.W, Kim J., Helgeson M.E., Waite J.H. and Valentine M.T., *"Network structure of the mussel plaque and its significance for load bearing and adhesion."*, APS March Meeting, San Antonio, TX, March 2015
11. **Filippidi**, DeMartini D.G., Danner E.W., Kim J., Helgeson M.E., Waite J. H., Valentine M.T., *"A novel view of the porous structure and mechanics of adhesive mussel plaques."* (poster) Materials Research Outreach Program Symposium, MRL, UC Santa Barbara, February 2015
10. **Filippidi E.**, Lerner E., Chaikin P.M., Pine D.J., *"Random Organization of Suspensions: Geometry versus Hydrodynamics."* APS March Meeting, Denver, CO, March 2014
9. **Filippidi E.**, Pine D.J., *"Criticality of non-colloidal suspensions under periodic shear."* APS March Meeting, Baltimore, MD, March 2013
8. **Filippidi E.**, Pine D.J., *"Application of the generalized fluctuation-dissipation theorem on a sheared suspension."* APS March Meeting, Boston, MA, February 2012
7. **Filippidi E.**, Franceschini A., Chaikin P.M. and Pine D.J., *"Critical phenomena in sheared suspensions."* (poster) at Gordon Research Seminar and Gordon Conference on Soft Matter Far from Equilibrium, Colby-Sawyer College, New London, NH, August 2011
6. **Filippidi E.**, Franceschini A. Chaikin P.M. and Pine D.J., *"Particle and fluid diffusivity of non-colloidal suspensions."* APS March Meeting, Dallas, TX, March 2011
5. **Filippidi E.**, Ramos L., Chaikin P., Pine D., *"Critical phenomena in periodically-sheared suspensions."* APS March Meeting, Portland, OR, March 2010
4. **Filippidi E.**, Pine D., Chaikin P., *"Self-organised criticality in sheared suspensions."* (poster), at the Conference on Flowing Complex Fluids: Rheological measurements and constitutive modelling at the Institute of Mathematics and its Applications, University of Minnesota, September 2009
3. **Filippidi E.**, Corte L., Chaikin P., Ramos L., Pine D., *"Self-organised criticality in periodically-sheared sedimenting suspensions."* APS March Meeting, Pittsburgh, PA, March 2009
2. **Filippidi E.**, Corte L., Chaikin P., Ramos L., Pine D., *"Self-organised criticality in periodically-sheared sedimenting suspensions."* 3rd I2CAM/FAPERJ School on Condensed Soft Matter Physics, Rio de Janeiro, Brazil, May 2009
1. Kinahan M.E., **Filippidi E.**, Köster S., Evans H., Pfohl T., Kaplan D. and Wong J.Y., *"A novel microfluidic method to fabricate regenerated Bombyx mori silk fibers for tissue engineering applications."* Materials Research Society Fall Meeting 2008

Conference Attendance

EMBL Conference "The expanding world of RBPs: from post-transcriptional control to riboregulation", Heidelberg, March, 2025

Publications

1669 citations, h-index 13 (Google Scholar), * indicates corresponding author

17. (under review) Delasoudas I., Kallivokas S.*, **Filippidi E.*** Elasticity and dynamics of elastomeric epoxy networks: comparing simulations and experiments at high frequency
16. **Filippidi E.***, Dhiman A.K., Li B., Athanasiou T, Vlassopoulos D., Fytas G.* Multiscale elasticity of epoxy networks by rheology and Brillouin light spectroscopy. **The Journal of Phys. Chem. B**, 128 (50), 12628-122637 (2024)

15. Shammas S., Heller G., Bah A., **Filippidi E.**, Holehouse A., Yu M., Lautenschläger J. Ordering the disordered. **Structure**, 32 (9), 1288-1293 (2024). Voices article featuring my research alongside six other young group leaders.

14. Li B., Alexandris S., Pantazidis C., Moghimi E, Sakellariou G., Vlassopoulos D., **Filippidi E.***
Mechanical properties of epoxy networks with metal coordination bonds: Insights from temperature and molar mass variation. **Macromolecules**, 57 (19), 9088-9096 (2024)

13. Spyridakou M., Iliopoulou E., Peponaki K., Alexandris S., **Filippidi E.***, Floudas G*. Heterogeneous local dynamics in mussel-inspired elastomers. **Macromolecules**, 56 (11), 4336-4345 (2023)

12. Bernstein J.H, **Filippidi E.**, Waite J.H. and Valentine M.T.* Effects of sea water pH on marine mussel plaque maturation. **Soft Matter**, 16 (40), 9339-9346 (2020)

11. **Filippidi E.**[$], Cristiani T.R.[$], Eisenbach C.D., Waite J.H., Israelachvili J.N., Ahn B.K. and Valentine M.T.
Toughening elastomers using mussel-inspired iron-catechol complexes. **Science**, 358 (6362), 502-505 (2017) [$]equal contribution

10. Cristiani T.R., **Filippidi E.**, Behrens R., Valentine M.T. and Eisenbach C.D. Tailoring the toughness of elastomers by incorporating ionic cross-linking. **Macromolecules**, 53 (10), 4099-4109 (2020)

9. Wilhelm M.H., **Filippidi E.**, Waite J.H. and Valentine M.T. Influence of multi-cycle loading on the structure and mechanics of marine mussel plaques, **Soft Matter**, 13 (40), 7381-7388 (2017)

8. Seo S., Lee D.W., Ahn J.S., Cunha K., **Filippidi E.**, Ju S.W., Shin E., Kim B.-S., Levine Z.A., Lins R.D., Israelachvili J.N., Waite J.H., Valentine M.T., Shea J.E. and Ahn B.K. Significant performance enhancement of polymer resins by bioinspired dynamic bonding. **Advanced Materials**, 29 (39), 1703026 (2017)

7. **Filippidi E.**, DeMartini D., Malo de Molina P., Danner E.W, Kim J., Helgeson M.E., Waite J.H. and Valentine M.T. The microscopic network structure of mussel (*Mytilus*) adhesive plaques. **J. R. Soc. Interface**, 12 (113), 20150827 (2015)

6. **Filippidi E.**, Patel A.R., Bouwens E.C.M., Voudouris P. and Velikov K.P. All-natural oil-filled microcapsules from water-insoluble proteins. **Advanced Functional Materials**, 24 (38), 5962-5968 (2014)

5. Franceschini A., **Filippidi E.**, Guazzelli E. and Pine D.J. Dynamics of non-Brownian fiber suspensions under periodic shear. **Soft Matter**, 10 (35), 6722-6731 (2014)

4. Franceschini A., **Filippidi E.**, Guazzelli E. and Pine D.J. Transverse alignment of fibers in a periodically sheared suspension: an absorbing phase transition with a slowly-varying control parameter.
Physical Review Letters, 107 (25), 250603 (2011)

3. Kinahan M.E., **Filippidi E.**, Köster S., Hu X., Evans H.M., Pfohl T., Kaplan D.L., Wong J. Tunable silk: using microfluidics to fabricate silk fibers with controllable properties. **Biomacromolecules**, 12 (5), 1504-1511 (2011)

2. **Filippidi, E.**, Michailidou, V., Loppinet, B., Rühe, J., Fytas G. Brownian diffusion close to a polymer brush. **Langmuir**, 23 (9), 5139-5142 (2007)

1. Kaufman L.J., Brangwynne C.P., Kasza K.E., **Filippidi E**., Gordon V.D., Deisboeck T.S., Weitz D.A. Glioblastoma multiforme shows distinct invasion and remodeling patterns in three dimensional collagen matrices of different concentration. **Biophysical Journal**, 89 (1), 635-650 (2005)

Manuscripts in preparation

1. Sampson I., McCall P., **Filippidi E.*** Enrichment of higher charge density species in polyelectrolytic complex coacervates. (Expected submission: Sept 2025)
2. Sampson I, Hyman A.A., **Filippidi E.***, From dilute to dense: how are conformations of an intrinsically disordered protein altered upon crowding and phase separation. (Expected submission: Dec 2025)
3. Invited to submit a review to Biophysics Reviews (https://pubs.aip.org/aip/bpr) on "Understanding and harnessing assembly processes in biological materials and biomimetics" (Expected submission: within 2025)
4. DeMartini D., Sampson I., Debastiani R., Waite J.H., Valentine M.T. and **Filippidi E.** Not all plaques are equal: variability in porosity among marine mussel genera.

In popular media

05/2020	Interview with the Federal German Ministry for Education and Research for the brochure **"Research careers in Germany"**
11/2017	**C&EN News** "Mussels' iron grip inspires strong and stretchy polymer," https://cen.acs.org/articles/95/i44/Mussels-iron-grip-inspires-strong-stretchy-polymer.html
10/2017	"Designing tougher elastomers with ionomers," **Brief Perspective** on Materials Science by Karen Winey, ***Science***, 358 (6362), 449-450, doi: 10.1126/science.aap8114
10/2017	"Material inspired by ocean mussels could lead to self-healing plastics," **News Piece** by Robert Service, ***Science***, doi:10.1126/science.aar3333
10/2017	"Learning from mussels: A marine bivalve inspires researchers to make stronger polymers," **Phys.org news**, https://phys.org/news/2017-10-mussels-marine-bivalve-stronger-polymers.html
08/2017	"A tougher tooth: A new dental restoration composite developed by UCSB scientists proves more durable than the conventional material," The **UCSB Current** newspaper http://www.news.ucsb.edu/2017/018209/tougher-tooth
08/2017	"A tougher tooth: A new dental restoration composite proves more durable than the conventional material," **ScienceDaily** https://www.sciencedaily.com/releases/2017/08/170821154616.htm
09/2016	"And the winner is ...," The **UCSB Current**, article about the Otis-Williams Fellowship award, http://www.news.ucsb.edu/2016/017126/and-winner?
02/2016	Image submission voted at the **Top 10** at the Biophysical Society **Art of Science Image Contest** and exhibited throughout the Annual Meeting, Los Angeles, CA
02/2016	**Art of Science Popular Vote winner**. The competition is open to UCSB students and post-docs and is organized by the Schuller Lab, the California Nanosystems Institute (CNSI), the UCSB Library and the AD&D Museum
03/2015	"How Do Mussels Stick to Wet Rocks?", **APS Physics Central Blog** http://physicsbuzz.physicscentral.com/2015/03/how-do-mussels-stick-to-wet-rocks.html
03/2015	"The application of physics," **BBC's Science in Action** podcast and radio interview

Outreach

Panelist	UCSB SACNAS-sponsored panel discussion "Surviving grad school". (11.2017)
Respondent	Writer-question respondent, UCSB, MRL-organized **ScienceLine** (2015 – 2018). *http://www.scienceline.ucsb.edu*
NanoDays 2015	**Led interactive demonstrations** of electron microscopy on portable SEM (04/2015). Funding: NSF Nanoscale Informal Science Education, Santa Barbara Museum of Natural History.
Science Nights	Hands-on activities at Santa Barbara middle schools with UCSB's MRL **"Solar Car** and **"It's a material world"** teams. (2014 – 2018). Lotus leaves, artificial snow, ferro fluids, memory wire, thermochromic materials.
Instructor	"Squishy Physics: **Soft Matter in the House**". Summer course for high school students organized by the Hellenic-American Educational Foundation in Athens, Greece (06.2013)

Skills

Experimental Methods

protein purification	rheology	scattering	microfluidics
electron microscopy (SEM)	specimen sectioning techniques	DSC	ITC
tensile testing	metal & plastic machining	laser cutting	cell culture

Marine Science relevant

Mussel Mariculture | SCUBA Open Water certification, Level I | Night Diving | Sailing (Optimist, Europe, J/22, J/24)

Computer Programming

Matlab | Python (beginner) | Fortran | AutoCad | HTML

Languages

Greek (native) | English (fluent) | Spanish (conversational) | Portuguese (conversational) | French (DELF A)