Barbara Capone - Curriculum vitae

Personal Data

Citizenship: Italian
Date of Birth: 1981, July the 3rd
Place of Birth: Rome, Italy

Dr. Barbara Capone
Science Department
Università di Roma Tre
Via della Vasca Navale 84, 00146, Rome, Italy
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RESEARCH FIELDS

Statistical Mechanics, Soft-Condensed Matter

Main Research Interests

Selective adsorption and release at the nano scale: theoretical design, computational validation and scale up, and close collaboration with experimental groups leading to the experimental realisation and validation of the designed material.

Equilibrium properties and collective behaviours of nanocomposites: aggregation phenomena, clustering, crystallisation and self-assembly.

Development of coarse-grained descriptions of polymeric macromolecular solutions and nanocomposites with focus on dilute and semi-dilute density regimes.

Modelling polymers with different architectures and microscopic interactions: star polymers, multiblock copolymers, brushes under various geometries.

Design of Functionalised Material at the Nano Scale

Citizen Science

EDUCATION AND RESEARCH EXPERIENCE

02/2023 **Associate Professor** in Theoretical Condensed Matter Physics.

02/2020-01/2023 **Assistant Professor** in Theoretical Condensed Matter Physics.

04/2018 **Abilitazione Scientifica Nazionale** Settore Concorsuale 02/B2, Italian Habilitation for Associate Professorship in the field of Theoretical Condensed Matter Physics.

06/2017-05/2019 **Marie Curie Individual Fellowship** at the Science Department of the **University of Rome 3** , Rome, Italy. Independent Position.

05/2014-05/2017 **APART** (Austrian Programme for Advanced Research and Technology) Fellow of the Austrian Academy of Sciences at the Physics Department of the **University of Vienna, Austria**. Independent Position.

06/2010-05/2014 **University Assistant** at the Physics Department of the **University of Vienna, Austria**, in the group of Prof. Christos N. Likos.

10-2006 - 03/2010 (Academic Year 2008-2009) **Ph. D.** at the Chemistry Department of the **University of Cambridge, United Kingdom**, with a thesis entitled *Coarse-graining polymer solutions in the semi-dilute regime*, under the supervision of Prof. Jean-Pierre Hansen. PhD Sponsored by a **Marie Curie Early Start European Grant**.

11/2000 - 01/2006 (Academic Year 2004-2005) **Master degree in Physics**, final mark 110/110 cum laude, at the Physics Department of the **University of Rome "La Sapienza"** with a thesis on *Off-equilibrium confined dynamics: analytical solution and entropic interpretation*, under the supervision of Dr. Irene Giardina, Prof. Enzo Marinari and Prof. Federico Ricci Tersenghi.

FELLOWSHIPS, AWARDED PROJECTS, ROLE COVERED IN EACH PROJECT AND ABILITY TO ATTRACT FUNDING

Winner of a **"Tenure Track Assistant Professor Position"** at the Eindhoven University of Technology, in the Department of Chemical Engineering and Chemistry (2018)

PI of a "Marie Curie Individial Fellowship" (2017-2019) score 94,20% , **168.227 euros awarded.**

PI of an "APART (Austrian Programme for Advanced Research and Technology) Fellowship of the Austrian Academy of Sciences" (2014-2017) at the Physics Department of the University of Vienna, Austria. Total amount **213.000 euros awarded.**

Early Stage Researcher with a "Marie Curie Early Research Grant" for a PhD at the University of Cambridge, UK (2006-2009) under the supervision of Prof. J.-P. Hansen

PI and Coordinator of the **"European Physical Society Special Activity Fund"**, a Scientific Dissemination Project that took place in Bethlehem in August 2018 in partnership with the European Physical Society, Bethlehem University. The project has been awarded with **5.000 euros.**

PI and Coordinator of an Italian PON project entitled "Design of smart polymeric materials for the selective removal and recovery of organic pollutants in acqueous solution", in collaboration with Saluber s.r.l and FORTH (Greece) Total amount **145.000 euros**

INVITED AND CONTRIBUTED TALKS AT INTERNATIONAL CONFERENCES AND WORKSHOPS
35 TALKS OUT OF WHICH 18 INVITED, 1 KEYNOTE

1. Talk at "36 European Colloid and Interface Society", 4-9/9/2022, Chania, Greece
2. Talk at "Water X, La Maddalena", Italy 28/5-2/6/2022
3. Invited talk at the "Combining multi-scale simulation and scattering for structural analysis of complex systems" CECAM meeting 26-27/01/2022, online meeting
4. Invited talk at the "Venice Meeting on Fluctuations in Small Complex Systems" V, 4-7/10/2021, Venice, Italy

5. Keynote talk at "35 conference of the European Colloid and Interface Society", 5-10/9/2021, Athens, Greece
6. Talk presented at the "5th International Soft Matter Conference (ISMC2019) ", 3-7/6/2019 Edinburgh, United Kingdom
7. Invited talk at the Challenges in Large Scale Biomolecular Simulation 2019: Bridging Theory and Experiments, 13-19/5/2019 Cargese, Corsica, France
8. Invited talk at the Venice Meeting on Fluctuations in Small Complex Systems IV, 13-18/10/2018, Venice, Italy
9. Talk presented at WaterX: exotic propertied of water under extreme conditions, 3-8/6/2018, La Maddalena, Italy
10. Invited talk at "CMD27, 2018 Joint Meeting of the DPG and EPS Condensed Matter Division", 11-16/3/2018, Berlin, Germany
11. Talk presented at FisMat 2017, 1-6/10/2017, Trieste, Italy
12. Invited talk at Physics@Veldhoven 17/1/2017, Veldhoven, Netherlands
13. Talk presented at "European Colloid and Interface Society (ECIS)", 4-9/9/2016, Rome, Italy
14. Invited talk at the EPS Board Meeting, at the round table "Physics for Sustainable Development", 1-2/4/2016, Mulhouse, France
15. Talk presented at "FisMat 2015" , 28/9-2/10 2015, Palermo, Italy
16. Talk presented at the "Congresso Nazionale SIF" 21-25/9/2015 Rome, Italy
17. Invited talk at the "4th EPS Young Minds Leadership Meeting", 29-30/5/2015, Barcelona, Spain
18. Invited talk as Plenary Speaker at the United Nations Seminar on Assistance to Palestinian People *"Speeding up Relief, Recovery and Reconstruction in Post-War Gaza?"* 31/3-1/4/2015, Vienna, Austria
19. Invited talk at the "XII International Symposium of University Professors", 26-27/6/2015, Rome, Italy
20. Invited talk at the "Knots in Soft Condensed Matter" CECAM Workshop, 10-13/9/2014, Vienna, Austria
21. Invited talk at the "Physics of colloidal particles with heterogeneously patterned surfaces" CECAM Workshop, 24-27/9/2014, Vienna, Austria
22. Talk at the "Molecular Liquids and Soft Matter: from Fundamentals to Applications" conference, 7-12/9/2014, Rome, Italy
23. Talk at the "9th Liquid Matter Conference", 21-25/7/2014, Lisbon, Portugal
24. Invited talk at the Jülich Forschungszentrum 18/11/2013, Jülich, Germany
25. Talk presented at "3rd International Soft Matter Conference" 15-19/9/2013, Rome, Italy

26. Talk presented at the ACS Workshop "Multiscale Modelling of Complex Systems" 8-12/9/2013, Indianapolis, USA

27. Talk presented at "Physics of Complex Colloids - COMPLOIDS 2013" 14-18/5/2013, Ljubljana, Slovenia

28. Invited talk at the University of Rome "La Sapienza" 26/4/2013, Rome, Italy

29. Invited talk at the SISSA workshop on "Statistical Physics of Bio-molecules", 20-21/12/2012, Trieste, Italy

30. Invited talk at the CECAM workshop on "Design of self-assembling materials", 04-07/09/2012, Vienna, Austria

31. Talk presented at the International workshop "Micro Structure, setting and aging of cement. From soft Matter Physics to sustainable materials", 12-16/8/2012, Monte Verità, Switzerland. This talk won the **CFS award for the best contribution given by a young scientist at the workshop**

32. Invited talk at the CECAM-RA workshop on "Coarse-Graining Strategies and Methodologies for Polymeric and Biomolecular Assemblies", 05-08/07/2011, Lyon, France

33. Talk presented at the "SoftComp Annual meeting", 16-18/5/2011, Heraklion, Greece

34. Talk presented at "2nd International Soft Matter Conference", 5-8/7/2010, Granada, Spain

35. Talk presented at the "EuroSim" first Annual meeting, May 2007, Lyon, France

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POSTERS

1. Poster presented at the "8th Liquid Matter Conference 2011", 6-10/09/2011, Vienna, Austria, *Self-Assembly in block copolymer stars*

2. Poster presented at the "7th Liquid Matter Conference", Lund, Sweden, 27/06-1/07/2008, *Diblock Copolymer self-assembly*

3. Poster presented at the "Soft, Complex and Bological Matter SOCOBIM" Conference, Città del Mare, 15-19/07/2007, Palermo (Cinisi), Italy, *Exploring the semi-dilute regime for polymer solutions*

ORGANISED CONFERENCES AND WORKSHOPS

1. **CECAM Workshop** (21-24/2/2017) "Challenges across Large-Scale Biomolecular and Polymer Simulations" organised by Ivan Coluzza, Samuela Pasquali, Barbara Capone, Christoph Dellago, Tamar Schlick, Vienna,

2. **CECAM Workshop** (29/11-2/12/2016) "Water at interfaces: from proteins to devices" organised by Valentino Bianco, Ivan Coluzza, Barbara Capone, Christoph Dellago, Vienna

3. **CECAM Workshop** (5-9/7/2011) "Coarse Graining Strategies and Methodologies for Polymeric and Biomolecular Assemblies" organised by Barbara Capone, Christos N. Likos, Jean-Pierre Hansen and Vincent Krakoviack, Lyon, France

4. Member of the local organising committee of the **"8th Liquid Matter Conference"**, Vienna, 6-10/9/2011

5. **ACS Workshop** (8-12/9/2013) "Multiscale Modelling of Complex Systems", organised by Marina Guenza and Barbara Capone, 246th National Meeting of the American Chemical Society, Indianapolis

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REFEREEING, EVALUATION AND EDITORIAL ACTIVITIES

Guest Editor for Nanoscale Advances, Royal Society of Chemistry

Member of the European Sounding Board of the H2020 Rethink European Project

Review Editor and Member of the Editorial Board of Soft Matter Physics, specialty section of Frontiers in Physics

Member of the Editorial Board of Journal of Physics Communications (IOP)

Scientific evaluator of the Partnership Programme PCCA of the Romanian National Council for Research and Development

External Reviewer for the Netherlands Organisation for Scientific Research

Referee for the following international journals:

Langmuir,
Nano Letters,
Physical Review Letters,
Soft Matter,
Europhysics Letters,
Journal of Chemical Physics,
Macromolecules,
Journal of Polymer Science B,
Colloid and Polymer Science,
JPCM,
Polymers,
Computational Materials Science,
Chemical Reviews
VQR evaluator

TEACHING EXPERIENCE

1. Fisica Sperimentale II, Science Department, University of Roma Tre, academic year 2022-2023
2. Matematica e Analisi dei Dati, Science Department, University of Roma Tre, academic year 2020-21, 2021-22, 2022-23
3. External examiner and member of the evaluating committee for the PhD Thesis of Negar Nahali at SISSA (Trieste, Italy), under the supervision of Dr. Angelo Rosa. The PhD defence took place on the 18-19/10/2017.
4. Laboratory Scientific Computing, Department of Physics, University of Vienna, academic year 2014-2015
5. Exercise classes for Classical Mechanics, University of Vienna, academic year 2013-2014. Course hold by Prof. C. N. Likos
6. Laboratory Scientific Computing, Department of Physics, University of Vienna, academic year 2013-2014
7. Exercise classes for Dynamics of Condensed Matter Systems (Physik IV), Department of Physics, University of Vienna, academic year 2012-2013. Course hold by Prof. Thomas Pichler and Prof. Jannik Meyer
8. Exercise classes for Electrodynamics, Department of Physics, University of Vienna, academic year 2012-2013. Course hold by Prof. C. N. Likos
9. Laboratory Scientific Computing, Department of Physics, University of Vienna, academic year 2012-2013
10. Exercise classes for Dynamics of Condensed Matter Systems (Physik IV), Department of Physics, University of Vienna, academic year 2011-2012. Course hold by Prof. Wolfgang Pfeiler
11. Exercise classes for Electrodynamics, Department of Physics, University of Vienna, academic year 2011-2012. Course hold by Prof. C. N. Likos
12. Exercise classes for Electrodynamics, Department of Physics, University of Vienna, academic year 2010-2011. Course hold by Prof. C. N. Likos
13. Supervision of the Statistical Mechanics course (exercise classes), Department of Chemistry, University of Cambridge, academic year 2008-2009. Course hold by Prof. D. Frenkel
14. Exercise classes for computational Science, Department of Chemistry, University of Cambridge, academic year 2006-2007
15. Supervision of the Statistical Mechanics course (exercise classes), Department of Chemistry, University of Cambridge, academic year 2007-2008. Course hold by Prof. J.-P. Hansen

SUPERVISION OF GRADUATE STUDENTS

Supervision of the graduate student Pietro Corsi, that graduated in may 2022. Results are published in

1. P. Corsi, E. Roma, T. Gasperi, F. Bruni, B. Capone *"Exploiting Scaling Laws for Polymeric Bottle Brushes: a Theoretical Coarse-Graining for Homopolymeric Branched Polymers"*, **Phys. Chem. Chem. Phys.**, 21, 14873, (2019)

2. P. Corsi, I. Venditti, C. Battocchio, F. Bruni, P. Prosposito, F. Mochi, B. Capone *"Designing an optimal ion adsorber at the nanoscale: a simple theoretical model for the unusual nucleation of AgNPs / Co^{2+} - Ni^{2+} binary mixtures"* , **J. Phys. Chem. C**, 123, 6, 3855, (2019)

3. P. Corsi, A. G. GarcÃ⬡a E. Roma, T. Gasperi, and B Capone *"Coarse graining and adsorption in bottlebrushâĂŞcolloid mixtures"* **Soft Matter**, 2021, 17, 3681-3687

4. E. Roma, P. Corsi, M. Willinger, N. Simon Leitner, R. Zirbs, E. Reimhult, B. Capone, and T. Gasperi, *"Theoretical and experimental design of heavy metal-mopping magnetic nanoparticles"*, **ACS Appl. Mater. Interfaces**, 13, 1, 1386âĂŞ1397 (2021)

5. B. Capone, P. Biocca, P. Corsi, C. Meneghini, M. Bicchieri, *"Does the Artemidorus papyrus have multiple lives? Seeking for the answer in the inks through a Raman and PCA analysis"*, ISSN 1296-2074, **J. Cultural Heritage (2021)**

6. M. Bicchieri, P. Biocca, C. Caliri, B. Capone, P. Corsi, C. Meneghini, F. P. Romano *"Artemidoro: segreti e scritture"* , **Il Papiro di Artemidoro, studio, analisi, restauro** Gangemi Editore, ISBN13: 9788849239157, ISBN10: 9788849239157

7. E. Roma, P. Corsi, E. Reimhult, B. Capone, T. Gasperi, *"Thermoresponsive block copolymer grafted on core-shell nanoparticles"*, AIP Conference Proceedings, 2416, 020018 (2021)

8. P. Corsi, C. A. De Filippo, S. Del Galdo, B. Capone *"Unveiling adsorption generality in polymeric macromolecules"*, **Soft Matter 18, 6353 (2022)**

9. C. A. De Filippo, S. Del Galdo, P. Corsi, C. De Michele, B. Capone *"On the role of Polydispersity on the Phase Diagram of Colloidal Solutions"* Soft Matter 19, 1732, (2023)

Supervision of the PhD student Carlo Andrea De Filippo. Results are published in

1. P. Corsi, C. A. De Filippo, S. Del Galdo, B. Capone *"Unveiling adsorption generality in polymeric macromolecules"*, **Soft Matter 18, 6353 (2022)**

2. C. A. De Filippo, S. Del Galdo, P. Corsi, C. De Michele, B. Capone *"On the role of Polydispersity on the Phase Diagram of Colloidal Solutions"* Soft Matter 19, 1732, (2023)

Co-supervision of the PhD student Daniela Marzi, Marie Curie PhD student in the group of Christos N. Likos, within the COMPLOIDS network at the University of Vienna, with a thesis on Star-Colloid mixtures and nanocomposites. PhD completed in 2014. Results of the collaboration are published in

1. D. Marzi, C. N. Likos, B. Capone, *"Coarse graining of star polymer colloid nanocomposites"* , **J. Chem. Phys.** 137, 014902 (2012)

2. D. Truzzolillo, D. Marzi, J. Marakis, B. Capone, M. Camargo, A. Munam, M. Gauthier, C. N. Likos, D. Vlassopoulos *"Glassy states in asymmetric mixtures of soft and hard colloids"*, **Phys. Rev. Lett.**, 111, 208301 (2013)

3. D. Marzi, B. Capone, J. Marakis, M. Consiglia Merola, D. Truzzolillo, D. Cipelletti, F. Moingeon, M. Gautier D. Vlassopoulos, C. N. Likos, M. Camargo *"Depletion, melting and reentrant solidification in mixtures of soft and hard colloids"*, **Soft Matter** 11, 8296 (2015)

PUBLICATIONS

1. S. Stagnoli, G. Macari, P. Corsi, B. Capone, A. Vidaurrazaga, J. Ereno-Orbea, A. Arda, F. Polticelli, J. Jimenez-Barbero , N. G.A. Abrescia, I. Coluzza*"Targeting the Spike: Repurposing Mithramycin and Dihydroergotamine to Block SARS-CoV-2"* submitted 2023

2. C. A. De Filippo, S. Del Galdo, P. Corsi, C. De Michele, B. Capone *"On the role of Polydispersity on the Phase Diagram of Colloidal Solutions"* **Soft Matter** 19, 1732, (2023)

3. P. Corsi, C. A. De Filippo, S. Del Galdo, B. Capone *"Unveiling adsorption generality in polymeric macromolecules"*, **Soft Matter** 18, 6353 (2022)

4. E. Roma, P. Corsi, E. Reimhult, B. Capone, T. Gasperi, *"Thermoresponsive block copolymer grafted on core-shell nanoparticles"*, AIP Conference Proceedings, 2416, 020018 (2021)

5. B. Capone, C. N. Likos, I. Coluzza, *"Grafting density induced reentrant disorder-order-disorder transition in planar di-block copolymer brushes"*, **Soft Matter** 2021, 17, 4719-4729 (This paper makes the cover page of the Soft Matter Issue)

6. P. Corsi, A. G. García, E. Roma, T. Gasperi, and B. Capone *"Coarse graining and adsorption in bottlebrush-colloid mixtures"* **Soft Matter**, 2021, 17, 3681 - 3687

7. E. Roma, P. Corsi, M. Willinger, N. Simon Leitner, R. Zirbs, E. Reimhult, B. Capone, and T. Gasperi, *"Theoretical and experimental design of heavy metal-mopping magnetic nanoparticles"*, **ACS Appl. Mater. Interfaces**, 13, 1, 1386âĂ-1397 (2021)

8. B. Capone, P. Biocca, P. Corsi, C. Meneghini, M. Bicchieri, *"Does the Artemidorus papyrus have multiple lives? Seeking for the answer in the inks through a Raman and PCA analysis"*, ISSN 1296-2074, **J. Cultural Heritage (2021)**

9. T. Cocchiaro, C. Meneghini, A. Dal Lago, C. Fabiani, M. Amodei, D. Miriello, C. Meneghini, B. Capone, A. Lenzi and R. Rago *"Assessment of Sexual and Emotional distress in infertile couple: validation of a new specific psychometric tool"*, **J. Endocrinol Invest 43, 12, 1729-1737 (2020)**

10. M. Bicchieri, P. Biocca, C. Caliri, B. Capone, P. Corsi, C. Meneghini, F. P. Romano *"Artemidoro: segreti e scritture"* , **Il Papiro di Artemidoro, studio, analisi, restauro** Gangemi Editore, ISBN13: 9788849239157, ISBN10: 9788849239157

11. P. Corsi, E. Roma, T. Gasperi, F. Bruni, B. Capone *"Exploiting Scaling Laws for Polymeric Bottle Brushes: a Theoretical Coarse-Graining for Homopolymeric Branched Polymers"*, **Phys. Chem. Chem. Phys.**, 21, 14873, (2019)

12. P. Corsi, I. Venditti, C. Battocchio, F. Bruni, P. Prosposito, F. Mochi, B. Capone *"Designing an optimal ion adsorber at the nanoscale: a simple theoretical model for the unusual nucleation of AgNPs / Co^{2+} - Ni^{2+} binary mixtures"* , **J. Phys. Chem. C**, 123, 6, 3855 , (2019)

13. B. Capone, E. Locatelli *"Design of Polymeric Self-Assembling Materials and Nanocomposites in the Semi-dilute Density Regime: Multiscale Modeling"*, chapter contribution in the book *"Design of self-assembling materials"*, pages 1-45, Springer International Publishing ISBN number 978-3-319-71576-6, (2017)

14. E. Bianchi, B. Capone, I. Coluzza, L. Rovigatti, P. J. van Oostrum *"Limiting the valence: advancements and new perspectives on patchy colloids, soft functionalized nanoparticles and biomolecules"*, **Phys. Chem. Chem. Phys.**, 19, 19847 (2017) This article is part of the themed collection: 2017 PCCP HOT Articles

15. B. Capone, F. Bruni *"Designing Nanomaterials for Sustainable Development"* **Il Nuovo Saggiatore**, Vol. 33, n. 5-6 (2017)

16. I. C. Garlea, E. Bianchi, B. Capone, L. Rovigatti, C. N. Likos Current Opinion in Colloid and Inrphace Science *"Hierarchical Self-Organization of Soft Patchy Nanoparticles into Morphologically Diverse Aggregates"*, **Current Opinion in Colloid & Interface Science**, 1-7, Vol. 30, (2017)

17. E. Locatelli, B. Capone, C. N. Likos *"Multiblob coarse-graining for mixtures of long polymers and soft colloids"*, **J. Chem. Phys.** 145, 17 , 174901 (2016)

18. L Rovigatti B. Capone, C. N. Likos *"Soft self-assembled nanoparticles with temperature dependent properties"*, **Nanoscale**, 8, 3288 (2016) (This paper makes the second cover page of the Nanoscale Issue)

19. A. Nikoubashman, N. A. Mahynski, B. Capone, A. Z. Panagiotopoulos, and C. N. Likos, *"Coarse-graining and phase behavior of model star polymer-colloid mixtures in solvents of varying quality"*, **J. Chem. Phys.**, 143 , 243108 (2015)

20. D. Marzi, B. Capone, J. Marakis, M. Consiglia Merola, D. Truzzolillo, D. Cipelletti, F. Moingeon, M. Gautier D. Vlassopoulos, C. N. Likos, M. Camargo *"Depletion, melting and reentrant solidification in mixtures of soft and hard colloids"*, **Soft Matter**, 11, 8296 (2015)

21. T. A. Grünewald, A. Lassenberger, R. Zirbs, B. Capone, P. van Oostrum, I. Vonderhaid, H. Lichtenegger, and E. Reimhult *"Core-shell structure of monodisperse PEG-coated iron oxide nanoparticles for biomedical applications"*, **Chem. Mater.**, 27 (13), 4763 (2015)

22. R. Blaak, B. Capone, C. N. Likos, and L. Rovigatti, *"Accurate Coarse-Grained Potentials for Soft Matter Systems, in Computational Trends in Solvation and Transport in Liquids – Lecture Notes"*, edited by G. Sutmann, J. Grotendorst, G. Gompper, and D. Marx. Forschungszentrum Jülich, IAS Series, Vol. 28 (2015), ISBN 978-3-95806-030-2.

23. E. Bianchi, B. Capone , G. Kahl and C. N. Likos *"Soft-patchy nanoparticles: modeling and self-organization"*, **Faraday Discuss.**, 181, 123 (2015)

24. A. Narros, C. N. Likos, A. Moreno B. Capone *"Multi-blob coarse graining for ring polymer solutions"*, **Soft Matter**, 10, 9601 (2014) (This paper makes the cover page of the Soft Matter Issue)

25. D. Truzzolillo, D. Marzi, J. Marakis, B. Capone, M. Camargo, A. Munam, M. Gauthier, C. N. Likos, D. Vlassopoulos *"Glassy states in asymmetric mixtures of soft and hard colloids"*, **Phys. Rev. Lett**, 111, 208301 (2013)

26. B. Capone, I. Coluzza, F. G. Lo Verso, R. Blaak, C. N. Likos *"Hierarchical self-assembling of telechelic star polymers: from soft patchy particles to diamond crystals"*, **New. J. Phys.**, 15, 095002 (2013)

27. I. Coluzza, P. van Oostrum, B. Capone, E. Reimhult, C. Dellago, *"Sequence Controlled Self-Knotting Colloidal Patchy Polymers"*, **Phys. Rev. Lett.**, 110, 075501 (2013)

28. I. Coluzza, P. van Oostrum. B. Capone, E. Reimhult, C. Dellago, *"Design and folding of colloidal patchy polymers"*, **Soft Matter** 9, 938 (2013)

29. B. Capone, I. Coluzza, F. G. Lo Verso, C. N. Likos, R. Blaak, *"Telechelic star polymers as self-assembling units from the molecular to the macroscopic scale"*, **Phys. Rev. Lett.**, 109, 238301 (2012)

30. D. Marzi, C. N. Likos, B. Capone, *"Coarse graining of star polymer colloid nanocomposites"* , **J. Chem. Phys.**, 137, 014902 (2012)

31. I. Coluzza, B. Capone, J.-P. Hansen, *"Rescaling of structural length scales for "soft effective segment" representation of polymers in good solvent"*, **Soft Matter**, 7, 5255 (2011)

32. B. Capone, I. Coluzza, J.-P. Hansen, *"A systematic coarse-graining strategy for semi-dilute copolymer solutions: from monomers to micelles"*, **J. Phys. Condens. Matt.**, 23, (2011)

33. B. Capone, I. Coluzza, J.-P. Hansen, *"Competing micellar and cylindrical phases in semi-dilute diblock copolymer solution"*, **Soft Matter**, 6, 6075 (2010)

34. J. J. Molina, C. Pierleoni, B. Capone, J.-P. Hansen, I. Saulo Santos de Oliveira, *"Crystal Stability of Diblock Copolymer Micelles in Solution"*, **Molecular Physics**, 107, 4 (2009)

35. B. Capone, C. Pierleoni, J.-P. Hansen, V. Krakoviack, *"Entropic self-assembly of diblock copolymers into disordered and ordered micellar phases"* , **J. Phys. Chem. B**, 113, 12, part of the PGG (Pierre-Gilles de Gennes) Memorial Issue (2009)

36. C. Pierleoni, B. Capone, J.-P. Hansen, *"A soft-effective segment representation of semi-dilute polymer solutions"* , **J. Chem. Phys.**, 127, 17 (2007)

37. B. Capone, T. Castellani, I. Giardina and F. Ricci Tersenghi, *"Off equilibrium confined dynamics in a glassy system with level crossing states"* , **Phys. Rev. B**, 74, 1 (2006)

Master and PhD Thesis

1. Master Thesis "Off-equilibrium confined dynamics: analytical solution and entropic interpretation" academic year 2004-2005 - defended 26/1/2006

2. PhD Thesis "Coarse-graining polymer solutions in the semi-dilute regime" PhD awarded 27/11/2010

SCIENCE FOR SUSTAINABLE DEVELOPMENT

Founder and C.E.O of the **International N.G.O. Sunshine4Palestine** (registered in UK, Palestine and Italy), association that aims at **developing sustainable alternative for assessing energy and water needs in emergency situations**.

The work of the N.G.O. was **recognised by the United Nations** and as C.E.O. I have been invited to relate as a plenary speaker at the **United Nations Seminar on Assistance to Palestinian People** *"Speeding up Relief, Recovery and Reconstruction in Post-War Gaza?"* that took place in Vienna, 31 March-1 April 2015.

In 2014 the N.G.O. **installed a modular plant on the Jenin Charitable Hospital in Gaza**. Prior to the installation of the plant the hospital could only work 4 hours a day. Now thanks to the first modulus of the Sunshine4Palestine plant, the hospital has 17 hours of operation time per day, completely off grid.

In February 2017 the N.G.O. started a **scientific dissemination project at the Bethlehem University**; An **agreement between the NGO, Bethlehem University and the European Physical Society** lead the creation of the Science4People section, that is carrying on an **extensive scientific dissemination project** in public, private schools in the west bank. The partnership with the European Physical Society and Bethlehem University lead to the creation of the Science4People Young Mind Section in Bethlehem.

The N.G.O. is currently in **partnership** with the **Abdus Salam International Centre for Theoretical Physics (ICTP), the European Physical Society, Beni Mellal University in Marocco and Bethlehem University** in Palestine for the creation of a *network of mediterranean Fablabs*. In April 2014 as a **collaboration between our N.G.O, the European Physical Society and the ICTP** brought *4 members of the Bethlehem Science4People to Trieste* where the group took a 2 weeks training course course at the ICTP in its SciFabLab maker space learning how to mount, unmount and program a 3D printer. A brief overview of the collaboration can be found here.

In August 2018 the N.G.O. lead **5 days of Scientific Dissemination Project in Bethlehem** that involved the whole municipality; the project saw **5 days of training, and a science fair** that has been organised in partnership with Bethlehem Municipality, Bethlehem University and the European Physical Society and saw the participation of **more than 2000 people**. Such a project has been **funded by the EPS Activity Fund**.

In September 2019 in collaboration with the University of Beni Mellal and the EPS, the N.G.O. will organise at the University of Beni Mellal a **workshop on the topics of Science for Sustainable Development in the Mediterranean** with specific focus on Water Management and Education.

The scientific activities in the field of Scientific Dissemination and Physics for Development have been highlighted in an interview on the EPS Fact and Info from the European Physical Society entitled "Portrait of Barbara Capone: when dreams come true" and on several Italian national newspapers as 27esima ora, Il Corriere della Sera or Io Donna, Corriere della Sera

The research lines on the Science for Sustainable Development gathered the attention of **many international scientific institutions**:

In April 2016, I was invited by the **European Physical Society** (EPS) to participate as speaker in a seminar on "Science and Development, Physics for Sustainable Development" at the EPS Board Meeting.

In September 2016, I was an invited speaker at **Austrian Physical Society** Annual Meeting , and asked to hold a seminar on the issues of "Science and Sustainable Development" and at the **Hungarian** school of excellence **Bolay College**, Budapest, to give a lecture on the impact of scientists and science for sustainable development.

In January 2017 I was an invited speaker with the topic "Development in emergency situation" at the Physics@Veldhoven, the annual congress of the **Dutch Physics Community**.

PRESS RELEASES (IN ITALIAN)

11/2018	*"Nanoparticles against pollutants"*, Platinum, Il Sole 24 ore

A brief selection amongst the over 100 articles that have been published on the Italian Newspapers, web journals or radios concerning the third mission activities:

20/5/2017	Article on Io Donna del Corriere della Sera entitled *"Insegnare la scienza, in Palestina"*
22/11/2016	Article on La 27 Ora del Corriere della Sera entitled *"Barbara, dalla fisica teorica al progetto per dare la luce a Gaza"*
28/2/2015	Article on Io Donna del Corriere della Sera entitled *"Luce sulla Striscia"*
24/2/2015	Interview at the National Rai Radio1 at the program *"La radio ne parla"*
19/2/2015	Article on Il Manifesto entitled *"Palestina Solare"*

INTERNATIONAL PRESS RELEASES:

11/05/2017	Article on *Horizon, the EU Research and Innovation magazine*: **FRONTIER RESEARCH : Microscopic Lego to keep scientists busy "for next 50 years"** (link)
17/01/2013	Press releases by *ScienceDaily*: **Soft Nanoscale "Lego" Built in the Computer** – Barbara Capone of the Computational Physics Group of the University of Vienna has developed a new method for the construction of building blocks at the nanoscale. The researcher in Soft Matter Physics, who works at the group of Christos Likos, Professor for Multiscale Computational Physics, has specialized in the self-assembly of materials at the nanoscale and she has published, together with her colleagues, a paper in the journal Physical Review Letters on "soft Lego." (link)
17/01/2013	Press releases by *Nanowerk news*: **Designing soft, self-assembling, nanoscale Lego** – In developing these novel self-assembling materials, postdoc Barbara Capone has focused on the design of organic and inorganic building blocks, which are robust and can be produced at large scale. (link)

17/01/2013 Press releases by *R&D Magazine*:
Self-assembled "soft Legos" create complex crystal shapes – Barbara Capone of the Computational Physics Group of the University of Vienna has developed a new method for the construction of building blocks at the nanoscale. (link)

17/01/2013 Press releases by *RedOrbit*:
New Method Developed For The Construction Of Building Blocks At The Nanoscale – Barbara Capone of the Computational Physics Group of the University of Vienna has developed a new method for the construction of building blocks at the nanoscale. (link)

17/01/2013 Press releases by *EurekAlert*:
Soft Lego built in the computer – In developing these novel self-assembling materials, postdoc Barbara Capone has focused on the design of organic and inorganic building blocks, which are robust and can be produced at large scale. Capone has put forward, together with her colleagues at the Universities of Vienna and Mainz, a completely new pathway for the construction of building blocks at the nanoscale. (link)

22/01/2013 Press releases by *Der Standard*:
Forscher entwickeln weiche "Legosteine"

17/01/2013 Press releases by *Innovations Report*:
Weiche Legosteine am Computer konstruiert – Barbara Capone von der Gruppe Computergestützte Physik der Universität Wien hat eine neue Methode zur Herstellung von Nanobausteinen entwickelt.(link)

17/01/2013 Press releases by *Pressrelations*:
Weiche Legosteine am Computer konstruiert – Barbara Capone von der Gruppe Computergestützte Physik der Universität Wien hat eine neue Methode zur Herstellung von Nanobausteinen entwickelt.(link)

17/01/2013 Press releases by *Informationsdienst Wissenschaft*:
Weiche Legosteine am Computer konstruiert – Barbara Capone von der Gruppe Computergesttzte Physik der Universitt Wien hat eine neue Methode zur Herstellung von Nanobausteinen entwickelt. Die Materialphysikerin, die bei Christos Likos, Professor fr Multiscale Computational Physics, zu selbstassemblierenden Materialien im Nanometerbereich forscht, hat zusammen mit KollegInnen einen Betrag zu "weichen Legosteinen" in der renommierten Fachzeitschrift Physical Review Letters publiziert. (link)

17/01/2013 Press releases by *Uni-Online*:
Simulationsschnappschuss eines kubischen Kristallgitters aus weichen Di-Block Kopolymer-Sternen. – Barbara Capone von der Gruppe Computergesttzte Physik der Universitt Wien hat eine neue Methode zur Herstellung von Nanobausteinen entwickelt. Die Materialphysikerin, die bei Christos Likos, Professor fr Multiscale Computational Physics, zu selbstassemblierenden Materialien im Nanometerbereich forscht, hat zusammen mit KollegInnen einen Betrag zu "weichen Legosteinen" in der renommierten Fachzeitschrift Physical Review Letters publiziert. (link)

PRESS RELEASES BY THE UNIVERSITY OF VIENNA:

17/01/2013	**Soft Lego built in the computer** – (link)
17/01/2013	**Weiche Legosteine am Computer konstruiert** – (link)

LANGUAGES

Italian : mother tongue
English : excellent (I.E.L.T.S certificate in 2006)
French : excellent
German : basic understanding

Last updated: March 6, 2023