Soft Matter

Where physics meets chemistry meets biology for fundamental soft matter research

rsc.li/soft-matter-journal

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

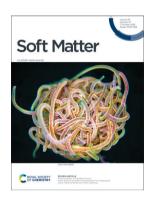
IN THIS ISSUE

ISSN 1744-6848 CODEN SMOABF 19(37) 7049-7256 (2023)



Cover

See Thomas Sottmann et al., pp. 7070–7083. Image reproduced by permission of Julian Fischer, Lionel Porcar, João T. Cabral and Thomas Sottmann from Soft Matter, 2023, 19, 7070.



Inside cover

Medical See Antoine Deblais, M. Saad Bhamla et al., pp. 7057–7069. Image reproduced by permission of Saad Bhamla from Soft Matter, 2023, 19, 7057.

REVIEW

7057

Worm blobs as entangled living polymers: from topological active matter to flexible soft robot collectives

Antoine Deblais,* K. R. Prathyusha, Rosa Sinaasappel, Harry Tuazon, Ishant Tiwari, Vishal P. Patil and M. Saad Bhamla*

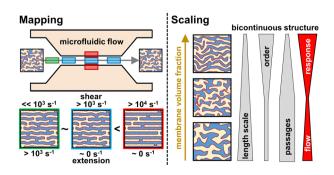


PAPERS

7070

Spatial mapping and scaling of the shear-induced transformation from bicontinuous microemulsions towards lamellar structures by coupling microfluidics and SANS

Julian Fischer, Lionel Porcar, João T. Cabral and Thomas Sottmann*



Editorial Staff

Executive Editor

Maria Southall

Deputy Editor Laura Ghandhi

Editorial Production Manager

CL: C L !!

Chris Goodall

Assistant Editors

Sean Browner, Molly Colgate, Paul Scott, Alison Winder

Editorial Assistant

Basita Javeed

Publishing Assistant Allison Holloway

Publisher

Sam Keltie

For queries about submitted papers, please contact
Emily Skinner Editorial Production Manager in the first instance.
E-mail: softmatter@rsc.org

For pre-submission queries please contact Maria Southall, Executive Editor. E-mail: softmatter-rsc@rsc.org

Soft Matter (electronic: ISSN 1744-6848)

is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, LIK CR4 OWF

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry,

Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail: orders@rsc.org

2023 Annual (electronic) subscription price: £1641; \$2891. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office:
Burlington House, Piccadilly, London W1J 0BA, UK,

Advertisement sales:

Telephone: +44 (0) 207 4378 6556.

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail: advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

Soft Matter

rsc.li/soft-matter-journal

An interdisciplinary journal focusing on innovative soft matter topics through original research amd reviews.

Editorial Board

Editor-in-Chief

Alfred Crosby, University of Massachusetts

Associate Editors

Roberto Cerbino, University of Vienna, Austria Lorna Dougan, University of Leeds, UK Ewa Górecka, Warsaw University, Poland Sanat Kumar, Columbia University, USA Guruswamy Kumaraswamy, Indian Institute of Technology Bombay, India Zhihong Nie, Fudan University, China Amy Shen, Okinawa Institute of Science and Technology, Japan Lixin Wu, Jilin University, China Emanuela Zaccarelli, Sapienza University of Rome, Italy Xuehua Zhang, University of Alberta, Canada

Advisory Board

Dave Adams, University of Glasgow, UK Shaun Ahn, Dow, USA Tommy Angelini, University of Florida, USA Markus Antonietti, Max Planck Institute of Colloids

and Interfaces, Germany Omar Azzaroni, UNLP, Argentina Piero Baglioni, University of Florence, Italy Anna Balazs, University of Pittsburgh, USA Arindam Baneriee, Indian Association for the

Cultivation of Science, India Madivala Basavaraj, Indian Institute of Technology Madras. India

Patricia Bassereau, Physico Chimie Curie Lab, France

Jasna Brujic, New York University, USA Jacinta Conrad, University of Houston, USA Vincent Craig, Australian National University, Australia

Emanuela Del Gado, Georgetown University, USA Jan Dhont, Forschungszentrum Jülich, Germany

Carmen Domene, University of Bath, UK Zahra Fakhraai, University of Pennysylvania, USA Glenn Fredrickson, University of California at Santa Barbara, USA

Valeria Garbin, TU Delft, The Netherlands

Jian Ping Gong, Hokkaido University, Japan lan Hamley, University of Reading, UK Jianbin Huang, Peking University, China Lucio Isa, ETH Zurich, Switzerland Paul Janmey, University of Pennsylvania, USA Gijsje Koenderink, AMOLF, Netherlands Daniela Kraft, Leiden University, Netherlands Eugenia Kumacheva, University of Toronto, Canada

Oleg Lavrentovich, Kent State University, USA Junbai Li, Institute of Chemistry, Chinese Academy of Sciences, China

Christos Likos, University of Vienna, Austria Dongsheng Liu, Tsinghua University, China Tom McLeish, University of York, UK Bradley Olsen, Massachusetts Institute of Technology, USA Rossana Pasquino, The University of Naples

Federico II, Italy Susan Perkin, University of Oxford, UK Sarah Perry, University of Massachusetts Amherst,

Darrin Pochan, University of Delaware, USA David Quéré, ESPCI, France Sriram Ramaswamy, Indian Institute of Science, Meital Reches, The Hebrew University of Jerusalem, Israel Alejandro Rey, McGill University, Canada

Connie Roth, Emory University, USA

Michael Rubinstein, Duke University, USA Sam Safran, Weizmann Institute of Science, Israel Takamasa Sakai, The University of Tokyo, Japan Peter Schurtenburger, Lund University, Sweden Kathleen Stebe, University of Pennslyvania, USA Joakim Stenhammar, Lund University, Sweden Howard Stone, Princeton University, USA Hajime Tanaka, University of Tokyo, Japan

Hajime Tanaka, University of Tokyo, Japan Evelyne Van Ruymbeke, Université Catholique de Louvain, Belgium Jan Vermant, ETH Zurich, Switzerland

Petia Vlahovska, Northwestern University, USA Dimitris Vlassopoulos, University of Crete, Greece Yilin Wang, Institute of Chemistry, Chinese Academy of Sciences, China Catherine Whitby, Massey University of New

Zealand, New Zealand Tim White, University of Colorado, USA Duyang Zang, Northwestern Polytechnical

Information for Authors

Full details on how to submit material for publication in Soft Matter are given in the Instructions for Authors (available from http://www.rsc.org/authors). Submissions should be made via the journal's homepage: rscli/soft-matter-journal. Submissions: The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Reviews, Perspectives, Tutorial Reviews. Full Papers and Communications should describe original work of high quality and impact.

 $\label{lem:conditional} Additional \ details \ are \ available \ from \ the \ Editorial \ Office \ or \ http://www.rsc.org/authors$

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is \circ The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the

University, China

Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

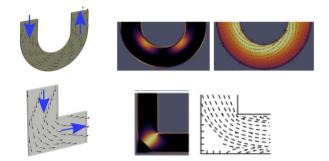
Registered charity number: 207890



7084

Curvature-mediated programming of liquid crystal microflows

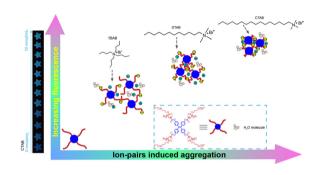
Kamil Fedorowicz,* Robert Prosser and Anupam Sengupta*



7093

Bioinspired simultaneous regulation in fluorescence of AlEgen-embedded hydrogels

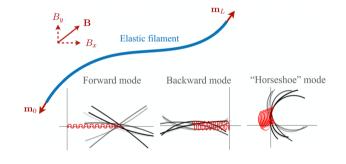
Li-Li Zhang, Yu Zhao, Ke-Xin Li, Sheng-Sheng Yu, Rui-Zhi Dong, Shuan-Hong Ma, Hui Liu,* Ling-Bao Xing* and Feng Zhou



7100

Elastohydrodynamic propulsion of a filament magnetically driven at both ends

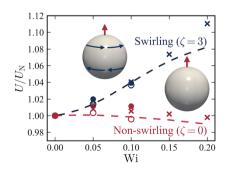
Ali Gürbüz, Ke Qin, Jake J. Abbott* and On Shun Pak*



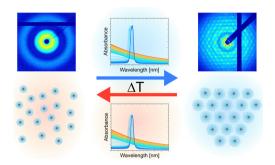
7109

Direct numerical simulations of a microswimmer in a viscoelastic fluid

Takuya Kobayashi, Gerhard Jung, Yuki Matsuoka, Yasuya Nakayama, John J. Molina and Ryoichi Yamamoto*



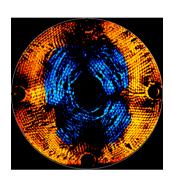
7122



Fluid-solid transitions in photonic crystals of soft, thermoresponsive microgels

M. Hildebrandt, D. Pham Thuy, J. Kippenberger, T. L. Wigger, J. E. Houston, A. Scotti and M. Karg*

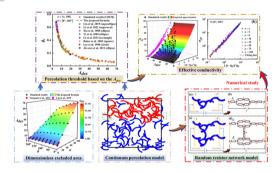
7136



Crossover from viscous fingering to fracturing in cohesive wet granular media: a photoporomechanics study

Yue Meng, Wei Li and Ruben Juanes*

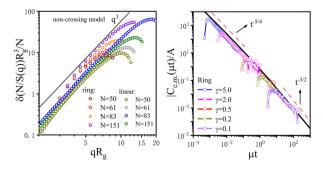
7149



Percolation threshold and electrical conductivity of conductive polymer composites filled with curved fibers in two-dimensional space

Hui Yuan, Huisu Chen,* Mingqi Li, Lin Liu and Zhiyong Liu

7161



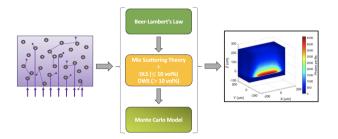
Non-Rouse behavior of short ring polymers in melts by molecular dynamics simulations

Yedi Li, Pu Yao and Hongxia Guo*

7172

Light scattering in a three-phase photosensitive system via Monte Carlo approach

Darshil M. Shah, Joshua P. Morris, Alireza V. Amirkhizi and Christopher. J. Hansen*

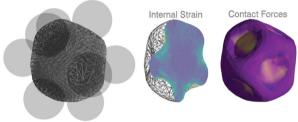


7184

An energy-optimization method to study gel-swelling in confinement

Chaitanya Joshi, Mathew Q. Giso, Jean-François Louf, Sujit S. Datta and Timothy J. Atherton*

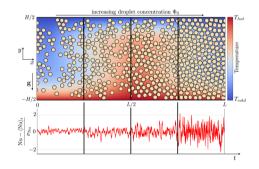
Simulating swollen hydrogels under confinement using Morpho



7192

Analysis of the heat transfer fluctuations in the Rayleigh-Bénard convection of concentrated emulsions with finite-size droplets

Francesca Pelusi,* Stefano Ascione, Mauro Sbragaglia and Massimo Bernaschi

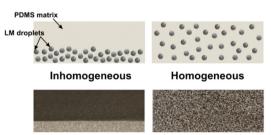


7202

Homogeneity of liquid metal polymer composites: impact on mechanical, electrical, and sensing behavior

Anh Hoang, Omar Faruqe, Elizabeth Bury, Chanyeop Park and Amanda Koh*

Liquid Metal Polymer Composites



7216

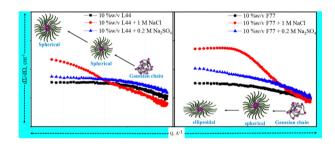




Shape transitions in a network model of active elastic shells

Ajoy Maji, Kinjal Dasbiswas and Yitzhak Rabin*

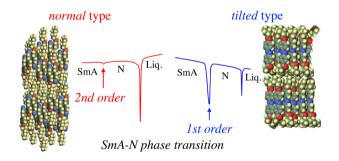




Salt induced micellization conduct in PEO-PPO-PEO-based block copolymers: a thermo-responsive approach

Nitumani Tripathi, Debes Ray, Vinod K. Aswal, Ketan Kuperkar* and Pratap Bahadur

7245



Molecular aggregation in liquid-crystalline layers crucially affects their physics: smectic A (SmA)-nematic (N) phase transition

Yasuhisa Yamamura,* Mizuki Ito, Kazutaka Sugai, Hiroshi Noda, Zbigniew Galewski and Kazuya Saito