

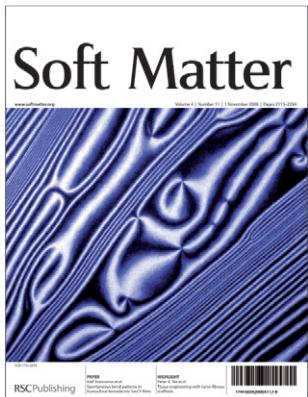
Soft Matter

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IN THIS ISSUE

ISSN 1744-683X CODEN SMOABF 4(11) 2113–2284 (2008)



Cover

See A. Eremin *et al.*,
pp. 2186–2191.
Polarization microscope image
of labyrinth formation in a freely
suspended film of a bent-core
smectic liquid crystal.
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2008, **4**, 2186.



Inside cover

See J. Baumgartl *et al.*,
pp. 2199–2201.
Experiments using colloidal
crystals and optical tweezers
to provide novel insights into
hydrodynamic interactions in
many-particle systems.
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Matter*, 2008, **4**, 2199.

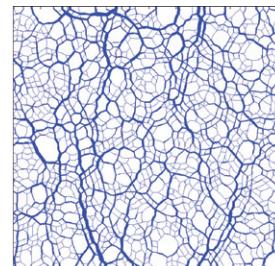
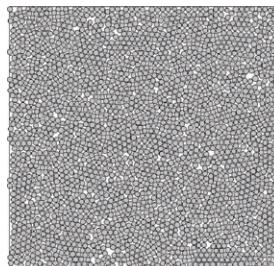
OPINION

2125

Granular matter and networks: three related examples

Ashley Smart and Julio M. Ottino*

This short article explores the networks viewpoint of granular matter, visiting three topics in granular physics—from small to progressively larger scales—where network-based approaches yield promising results.



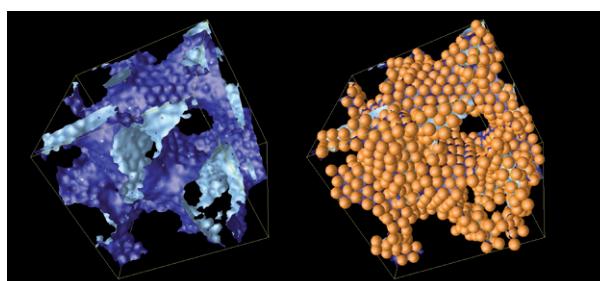
HIGHLIGHTS

2132

Bijels: a new class of soft materials

Michael E. Cates and Paul S. Clegg

Phase separation of binary fluids in the presence of colloidal particles can give rise to bicontinuous interfacially jammed emulsion gels ('bijels') in which domains of both fluids percolate within a gel matrix.



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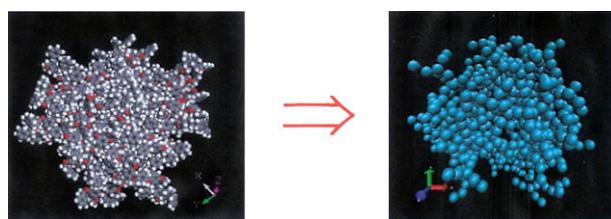
HIGHLIGHTS

2139

Realistic numerical simulations of dendrimer molecules

Juan J. Freire*

Realistic simulations of dendrimers can be performed using molecular dynamics with atomistic models or with Monte Carlo methods that are more easily applied to coarse-grained models.

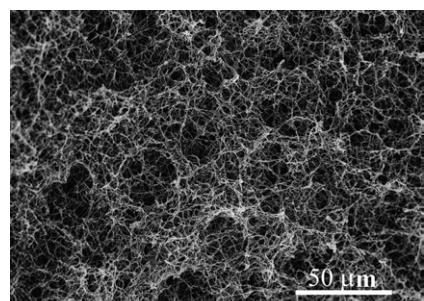


2144

Tissue engineering with nano-fibrous scaffolds

Laura A. Smith, Xiaohua Liu and Peter X. Ma*

Biomimetic scaffolds attempt to emulate the native extracellular matrix of tissues, particularly type I collagen. This review examines fabrication of nano-fibrous scaffolds and their cellular effect in tissue engineering.



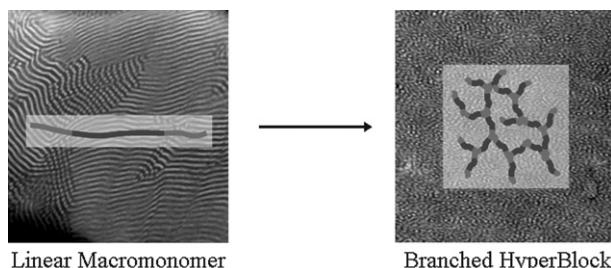
REVIEW

2150

DendriMacs and HyperMacs – emerging as more than just model branched polymers

Lian R. Hutchings*

This review discusses the latest developments in the construction of long-chain branched polymers and describes how the ‘macromonomer approach’ is emerging as possibly the most precise and versatile of the methodologies.



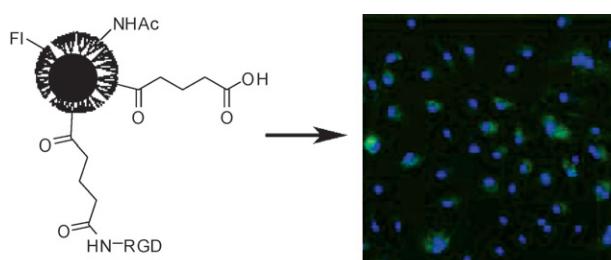
COMMUNICATIONS

2160

Tumor microvasculature targeting with dendrimer-entrapped gold nanoparticles

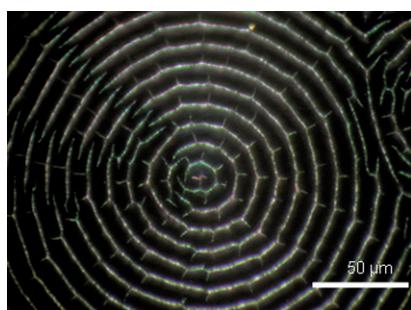
Rameshwar Shukla,* Elliott Hill, Xiangyang Shi, Jinkoo Kim, Maria C. Muniz, Kai Sun and James R. Baker Jr.*

RGD peptide-modified generation 5 poly(amidoamine) dendrimers can be used for template synthesis of gold nanoparticles inside dendrimers, providing a unique platform for tumor microvasculature targeting.



COMMUNICATIONS

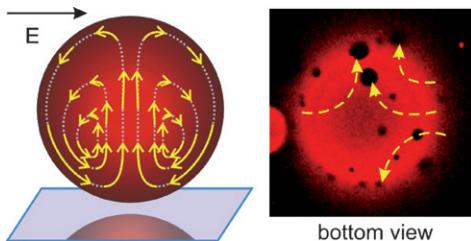
2164

**Self-assembled nanostructures from homopolymer induced by UV and solvent exposure**

Sailaja Chada and Mingdi Yan*

Polystyrene thin films, when exposed to UV light and treated with a solvent, yielded unique nanostructures resulting from phase separation and self-assembly.

2168

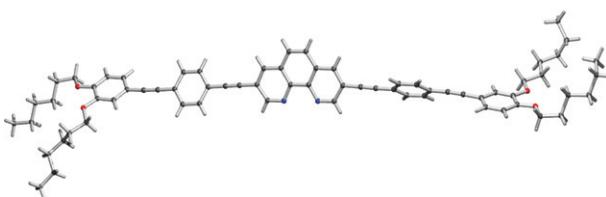
**Membrane flow patterns in multicomponent giant vesicles induced by alternating electric fields**

Margarita Staykova, Reinhard Lipowsky and Rumiana Dimova*

Alternating electric (AC) fields induce circular patterns of lipid transport in membranes of giant vesicles. The flow is visualized by fluorescently labelled lipid domains.

PAPERS

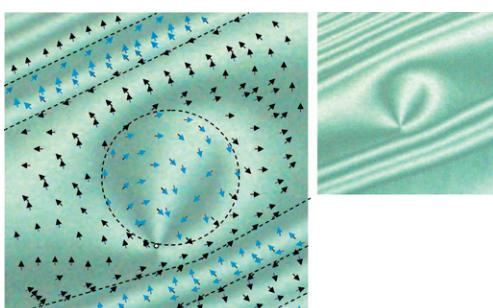
2172

**Rigid tetracatenar liquid crystals derived from 1,10-phenanthroline**

Thomas Cardinaels,* Jan Ramaekers, Peter Nockemann, Kris Driesen, Kristof Van Hecke, Luc Van Meervelt, Guojie Wang, Steven De Feyter, Eva Fernandez Iglesias, Daniel Guillou, Bertrand Donnio,* Koen Binnemans and Duncan W. Bruce*

Tetracatenar liquid crystals with an extended rigid core derived from 1,10-phenanthroline show a rich mesomorphism (SmC , Cub , Col_h and Col_t phases) depending on the alkoxy chain length.

2186

**Spontaneous bend patterns in homochiral ferroelectric SmCP films: evidence for a negative effective bend constant**

Alexey Eremin, Alexandru Nemes, Ralf Stannarius,* Gerhard Pelzl and Wolfgang Weissflog

Stripe and labyrinth textures can form in consequence of ambidextrous spontaneous bend in smectic liquid-crystal films. The introduced model assumes a negative effective bend constant for the c -director.

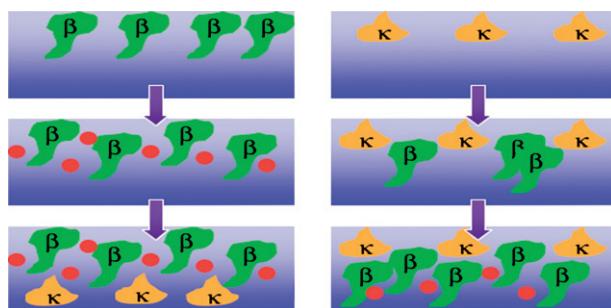
PAPERS

2192

Reactions of isolated mono-molecular protein films

Adam W. Perriman, Duncan J. McGillivray and John W. White*

Subphase replacement allows the structure of interacting casein protein networks at the air–water interface, built up in a controlled and order specific fashion, to be studied using X-ray reflectometry.

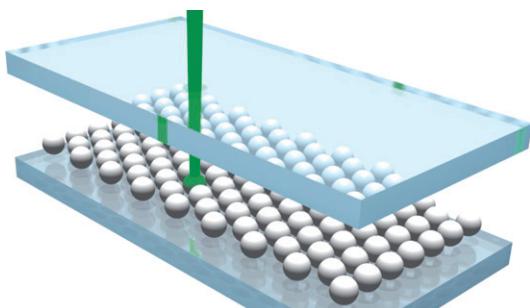


2199

Phonon dispersion curves of two-dimensional colloidal crystals: the wavelength-dependence of friction

Jörg Baumgartl,* Julian Dietrich, Jure Dobnikar, Clemens Bechinger and Hans Hennig von Grünberg

Hydrodynamic interactions in colloidal crystals can now be studied experimentally using an approach based on the overdamped phonon dispersion relation.

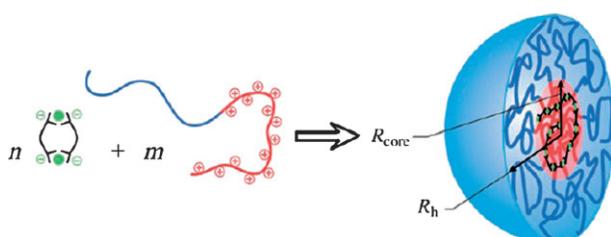


2207

Spherocylindrical coacervate core micelles formed by a supramolecular coordination polymer and a diblock copolymer

Yun Yan,* Ludger Harnau,* Nicolaas A. M. Besseling, Arie de Keizer, Matthias Ballauff, Sabine Rosenfeldt* and Martien A. Cohen Stuart*

We report on the hierarchical structure of complex coacervate core micelles formed by mixing a supramolecular coordination polymer and a diblock copolymer.

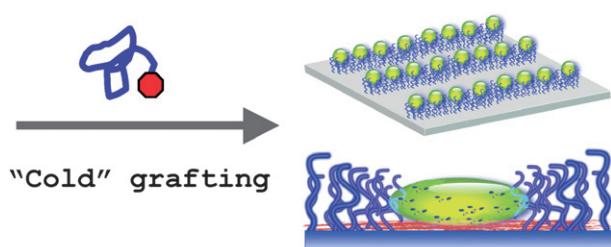


2213

Nano-patterning with polymer brushes *via* solvent-assisted polymer grafting

Bogdan Zdryko,* Olha Hoy, Mark K. Kinnan, George Chumanov and Igor Luzinov*

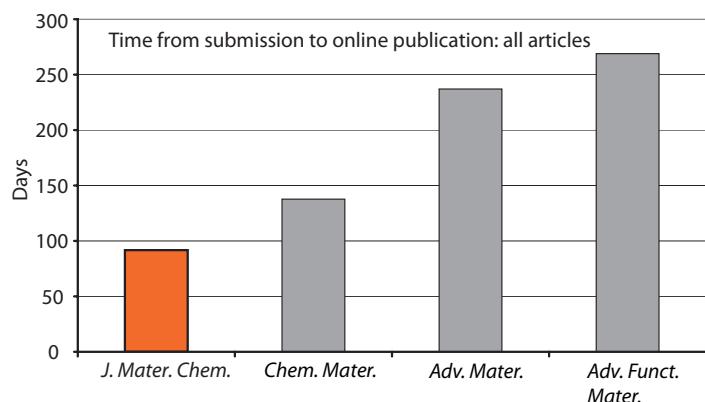
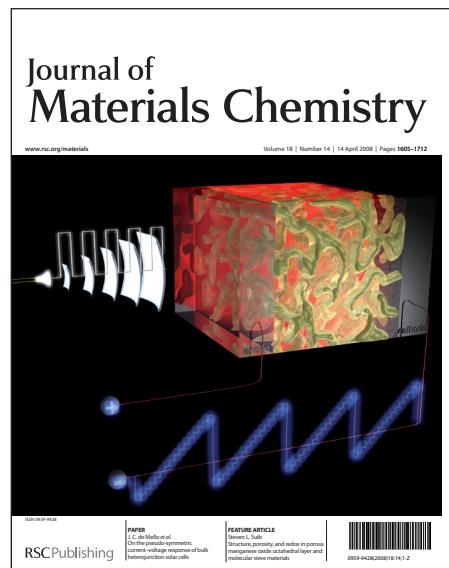
A nano-patterning procedure *via* polymer grafting, which allows effective chemical bonding of the polymer below its glass (melting) transition temperature, is reported.



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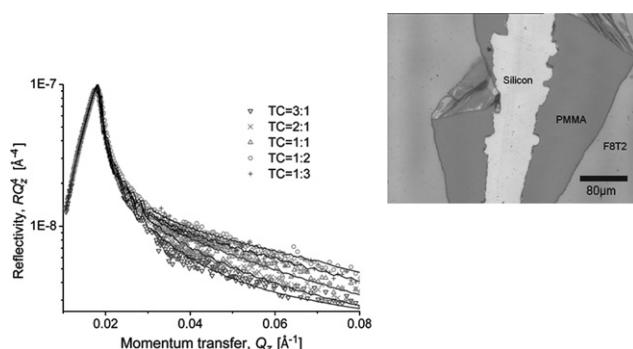
PAPERS

2220

Control of roughness at interfaces and the impact on charge mobility in all-polymer field-effect transistors

Shion Seng Chang, Ana B. Rodriguez,
Anthony M. Higgins,* Chuan Liu, Mark Geoghegan,
Henning Sirringhaus, Fabrice Cousin, Robert M. Dalgleish
and Yvonne Deng

The roughness at a dielectric (PMMA)–semiconductor (F8T2) interface in an all-polymer field-effect transistor is controlled by using a mixed solvent to deposit the semiconductor on top of the insulator. Charge mobility at the interface is influenced by the quality of the mixed solvent with respect to both polymers, *via* the competing effects of F8T2 packing and interfacial roughening.

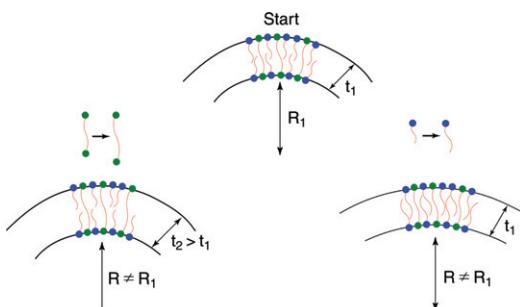


2225

A small angle neutron scattering study of the thicknesses of vesicle bilayers formed from mixtures of alkyl sulfates and cationic bolaform surfactants

Frank Pierce Hubbard Jr. and Nicholas Lawrence Abbott*

SANS is used to demonstrate that the bilayer thickness of vesicles formed from mixtures of rigid, cationic, bolaform surfactants and classical anionic surfactants is dictated by the length of the bolaform surfactant.

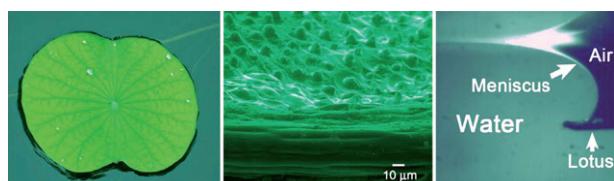


2232

How does the leaf margin make the lotus surface dry as the lotus leaf floats on water?

Jihua Zhang, Jinming Wang, Yong Zhao, Liang Xu,
Xuefeng Gao, Yongmei Zheng* and Lei Jiang*

A smart role of the leaf margin is attributed to anisotropic topography at the margin which introduces a strong energy barrier against water that tends to return to the surface of the leaf.

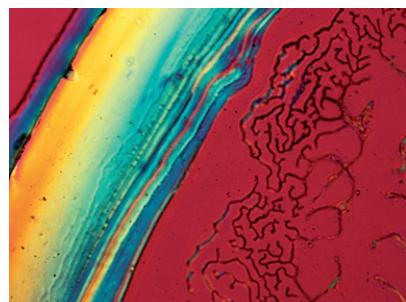


2238

Cationic surface functionalization of cellulose nanocrystals

Merima Hasani, Emily D. Cranston, Gunnar Westman
and Derek G. Gray*

The normally anionic surface of cellulose nanocrystals, prepared by sulfuric acid hydrolysis of cotton, was rendered cationic through reaction with epoxypropyltrimethylammonium chloride. The resultant ordered nanocrystal suspensions showed thixotropic properties.





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Symposium: Soft Matter

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Soft Matter

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Soft matter is not a new topic – indeed de Gennes was awarded a Nobel prize for research into soft matter in 1991. However more and more researchers are realising that the work they do, on the edges of physics, chemistry, materials science, or biology, does not fit into these traditional disciplines but it does fit under the umbrella term of ‘soft matter’.

This meeting aims to give researchers from all areas of soft matter the chance to discuss their research and to see how their knowledge can be applied in solving a range of soft matter problems, from adhesion to cell membranes to rheology of polymer mixtures.

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- Molecular self-organisation of soft systems (e.g. peptide, copolymers, biomaterials)
- Proteins and cells (e.g. cell adhesion, membranes, biophysics)
- Surfaces/rheology (e.g. polymer physics, theory)



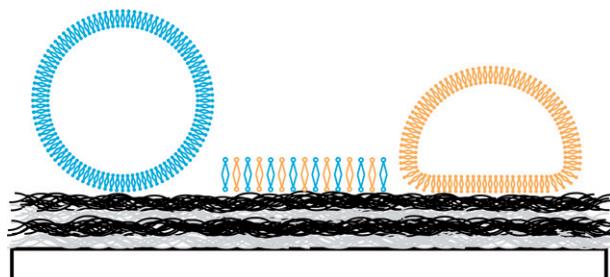
PAPERS

2245

**Lipid layers on polyelectrolyte multilayer supports**

Martin Fischlechner,* Markus Zaulig, Stefan Meyer, Irina Estrela-Lopis, Luis Cuéllar, Joseba Irigoyen, Paula Pescador, Milan Brumen, Paul Messner, Sergio Moya and Edwin Donath

This article explores the mechanisms of lipid membrane formation on polyelectrolyte multilayer supports. Very different structures may be formed, ranging from genuine bilayers to adsorbed vesicles and novel 3D lipid–polyelectrolyte phases.

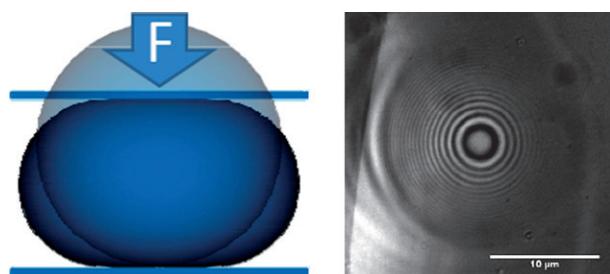


2259

**Separating membrane and surface tension contributions in Pickering droplet deformation**

James K. Ferri, Philippe Carl, Nikolce Gorevski, Thomas P. Russell, Qian Wang, Alexander Böker and Andreas Fery*

Using combined force/shape measurements and continuum mechanical modeling we can separate for the first time the contributions of surface tension and membrane-tension to deformation forces of Pickering droplets.

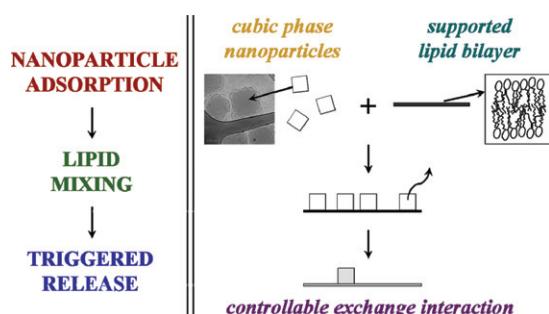


2267

**Adsorption of cubic liquid crystalline nanoparticles on model membranes**

Pauline Vandoolaeghe,* Adrian R. Rennie, Richard A. Campbell, Robert K. Thomas, Fredrik Höök, Giovanna Fragneto, Fredrik Tiberg and Tommy Nylander

Interactions between cubic phase nanoparticles and supported lipid bilayers have been studied using ellipsometry, QCM-D and neutron reflectivity. The adsorption, exchange and release mechanism has potential in drug delivery applications.

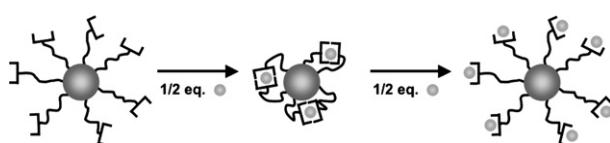


2278

**Tuning block copolymer micelles by metal-ligand interactions**

Pierre Guillet, Charles-André Fustin, Clément Mugemana, Christina Ott, Ulrich S. Schubert and Jean-François Gohy*

The ability to tune the size of micelles, self-assembled from a terpyridine end-capped copolymer, by a metal-ion induced conformational change of the coronal chains, is demonstrated.



AUTHOR INDEX

- Abbott, Nicholas Lawrence, 2225
 Baker Jr., James R., 2160
 Ballauff, Matthias, 2207
 Baumgartl, Jörg, 2199
 Bechinger, Clemens, 2199
 Besseling, Nicolaas A. M., 2207
 Binnemanns, Koen, 2172
 Böker, Alexander, 2259
 Bruce, Duncan W., 2172
 Brumen, Milan, 2245
 Campbell, Richard A., 2267
 Cardinaels, Thomas, 2172
 Carl, Philippe, 2259
 Cates, Michael E., 2132
 Chada, Sailaja, 2164
 Chang, Shion Seng, 2220
 Chumanov, George, 2213
 Clegg, Paul S., 2132
 Cohen Stuart, Martien A., 2207
 Cousin, Fabrice, 2220
 Cranston, Emily D., 2238
 Cuéllar, Luis, 2245
 Dalgleish, Robert M., 2220
 De Feyter, Steven, 2172
 de Keizer, Arie, 2207
 Deng, Yvonne, 2220
 Dietrich, Julian, 2199
 Dimova, Rumiana, 2168
 Dobnikar, Jure, 2199
 Donath, Edwin, 2245
 Donnio, Bertrand, 2172
 Driesen, Kris, 2172
 Eremin, Alexey, 2186
 Estrela-Lopis, Irina, 2245
 Ferri, James K., 2259
 Fery, Andreas, 2259
 Fischlechner, Martin, 2245
 Fragneto, Giovanna, 2267
 Freire, Juan J., 2139
 Fustin, Charles-André, 2278
 Gao, Xuefeng, 2232
 Geoghegan, Mark, 2220
 Gohy, Jean-François, 2278
 Gorevski, Nikolce, 2259
 Gray, Derek G., 2238
 Guillet, Pierre, 2278
 Guillot, Daniel, 2172
 Harnau, Ludger, 2207
 Hasani, Merima, 2238
 Higgins, Anthony M., 2220
 Hill, Elliott, 2160
 Hoy, Olha, 2213
 Höök, Fredrik, 2267
 Hubbard Jr., Frank Pierce,
 2225
 Hutchings, Lian R., 2150
 Iglesias, Eva Fernandez, 2172
 Irigoyen, Joseba, 2245
 Jiang, Lei, 2232
 Kim, Jinkoo, 2160
 Kinnan, Mark K., 2213
 Lipowsky, Reinhard, 2168
 Liu, Chuan, 2220
 Liu, Xiaohua, 2144
 Luzinov, Igor, 2213
 Ma, Peter X., 2144
 McGillivray, Duncan J., 2192
 Messner, Paul, 2245
 Meyer, Stefan, 2245
 Moya, Sergio, 2245
 Mugemana, Clément, 2278
 Muniz, Maria C., 2160
 Nemes, Alexandru, 2186
 Nockemann, Peter, 2172
 Nylander, Tommy, 2267
 Ott, Christina, 2278
 Ottino, Julio M., 2125
 Pelzl, Gerhard, 2186
 Perriman, Adam W., 2192
 Pescador, Paula, 2245
 Ramaekers, Jan, 2172
 Rennie, Adrian R., 2267
 Rodríguez, Ana B., 2220
 Rosenfeldt, Sabine, 2207
 Russell, Thomas P., 2259
 Schubert, Ulrich S., 2278
 Shi, Xiangyang, 2160
 Shukla, Rameshwer, 2160
 Sirringhaus, Henning, 2220
 Smart, Ashley, 2125
 Smith, Laura A., 2144
 Stannarius, Ralf, 2186
 Staykova, Margarita, 2168
 Sun, Kai, 2160
 Thomas, Robert K., 2267
 Tiberg, Fredrik, 2267
 Van Hecke, Kristof, 2172
 Van Meervelt, Luc, 2172
 Vandoolaeghe, Pauline, 2267
 von Grünberg, Hans Hennig,
 2199
 Wang, Guojie, 2172
 Wang, Jinming, 2232
 Wang, Qian, 2259
 Weissflog, Wolfgang, 2186
 Westman, Gunnar, 2238
 White, John W., 2192
 Xu, Liang, 2232
 Yan, Mingdi, 2164
 Yan, Yun, 2207
 Zaulig, Markus, 2245
 Zdyrko, Bogdan, 2213
 Zhang, Jihua, 2232
 Zhao, Yong, 2232
 Zheng, Yongmei, 2232

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