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Colloidal, Macromolecular and Biological Gels II

Proceedings

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7-16-2019

### Conference Program

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*Program*

# Colloidal, Macromolecular & Biological Gels II

July 21–24, 2019  
Maryborough Hotel  
Cork, Ireland

Conference Co-Chairs

**Samiul Amin**  
Manhattan College, USA

**Saad Khan**  
North Carolina State University  
USA

**Srinivasa Raghavan**  
University of Maryland, USA



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**Maryborough Hotel and Spa**

**Maryborough Hill**

**Douglas, Cork, Ireland, T12 XR12**

**Tel: +353 21 436 5555**

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**Previous conference in this series**

***Colloidal, Macromolecular & Biological Gels:  
Formulation, Properties & Applications***

**July 10-14, 2016**

**Hernstein, Austria**

*Conference Chairs:*

Samiul Amin, L'Oreal , USA

Saad Khan, North Carolina State University, USA

## **Sunday, July 21, 2019**

2:30 pm – 4:00 pm Conference check-in (Sherrard Foyer)

4:20 pm – 4:30 pm Welcome and conference logistics  
Srini Raghavan and Saad Khan

### **Session 1: Engineering and Fabrication of New Materials**

Session Chair: Orlando Rojas

4:30 pm – 5:00 pm Orlin Velev, NC State University, USA  
A NEW CLASS OF SOFT DENDRITIC COLLOIDAL MICROGELS WITH  
EXTRAORDINARY GELATION AND ADHESIVE CAPABILITIES

5:00 pm – 5:30 pm Vijay John, Tulane University, USA  
THE DESIGN OF FUNCTIONAL SUPRAMOLECULAR GELS AND COATINGS USING  
HYDROPHOBICALLY MODIFIED BIOPOLYMERS AND POLYPEPTOIDS

5:30 pm – 6:00 pm Oguz Okay, Istanbul Technical University, Turkey  
SUPRAMOLECULAR POLYMERIC GELS AND ELASTOMERS WITH SELF-HEALING  
AND SHAPE-MEMORY FUNCTIONS

6:00 pm – 6:30 pm Michel Cloitre, ESPCI PSL, France  
ENGINEERING GLASSES AND GELS USING SOFT COLLOIDS

6:30 pm – 7:30 pm Welcome reception with entertainment (Orangery)

7:30 pm – 9:00 pm Dinner (Bellini's Restaurant)

### **NOTES**

- *Technical sessions will be in Sherrard Suite B. Poster sessions will be in Sherrard Suite A.*
- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) are strictly prohibited during the technical sessions, unless the author and ECI have granted prior permission.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before). Please leave at least 3-5 minutes for questions and discussion.*
- *All breakfasts and lunches, as well as dinners on Sunday and Monday, will be in Bellini's Restaurant.*
- *The conference banquet on Tuesday will be in the Orangery.*
- *Coffee breaks will be in Sherrard Suite A.*
- *The ECI Office is in the Cedar Room.*
- *Please do not smoke at any conference functions.*
- *Turn your mobile telephones to vibrate or off during technical sessions.*
- *Please write your name on your program so that it can be returned to you if lost or misplaced.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*
- *Emergency Contact Information: Because of privacy concerns, ECI does not collect or maintain emergency contact information for conference participants. If you would like to have this information available in case of emergency, please place your emergency contact information on the reverse side of your name badge.*

## **Monday, July 22, 2019**

7:00 am – 8:30 am Breakfast buffet

### **Session 2: Biopolymers, Biological Networks and Hydrogels – I**

Session Chairs: Vijay John, Kelly Schultz

- 8:30 am – 9:00 am Gregory Payne, University of Maryland, USA  
BIOLOGY AS A SOURCE OF EXCITABLE MEDIA FOR COMPLEX AND RECONFIGURABLE HYDROGELS
- 9:00 am – 9:30 am Ronit Bitton, Ben-Gurion University of the Negev, Israel  
POLYSACCHARIDE HYDROGELS CROSS-LINKED VIA PEPTIDE-DENDRIMERS
- 9:30 am – 10:00 am Jessica Schiffman, U. Massachusetts @ Amherst, USA  
BACTERIA ADHESION IS MECHANOSENSITIVE TO POLYMER GEL PROPERTIES
- 10:00 am – 10:30 am Kenji Aramaki, Yokohama National University, Japan  
HYDROGEL FORMED BY ORGANOGELATOR THROUGH SURFACTANT-MEDIATED GELATION (SMG) METHOD
- 10:30 am – 11:00 am Coffee break
- 11:00 am – 11:30 am Orlando Rojas, Aalto University, Finland  
HYDROGELS OF CHIRAL-NEMATIC CELLULOSE NANOCRYSTALS AND NANOCHITIN
- 11:30 am – 12:00 pm Justin Burton, Emory University, USA  
TIME-DEPENDENT FRICTION AND DYNAMICS IN HYDROGEL SURFACE CONTACTS
- 12:00 pm – 12:30 pm Krassimir Velikov, Unilever, Netherlands  
ENHANCED STIFFNESS OF BIO-BASED COMPOSITE GELS COMPRISING CELLULOSE MICROFIBRILS AND PLANT-DERIVED BIOPOLYMERS
- 12:30 pm – 2:00 pm Lunch
- 2:00 pm – 4:30 pm Networking / free time / *ad hoc* sessions

### **Session 3: Biopolymers, Biological Networks and Hydrogels – II**

Session Chair: Dave Adams

- 4:30 pm – 5:00 pm Kelly Schultz, Lehigh University, USA  
RHEOLOGICAL CHARACTERIZATION OF DYNAMIC RE-ENGINEERING OF THE PERICELLULAR REGION BY HUMAN MESENCHYMAL STEM CELL-SECRETED ENZYMES IN WELL-DEFINED HYDROGEL SCAFFOLDS
- 5:00 pm – 5:30 pm Shih-Huang Tung, National Taiwan University, Taiwan  
LECITHIN ORGANOGELS INDUCED BY SIMPLE INORGANIC SALTS
- 5:30 pm – 6:00 pm Daniel King, Hokkaido University, Japan  
MACROSCALE DOUBLE NETWORKS: EXPANDING THE "SACRIFICIAL BOND CONCEPT" TO LARGE LENGTH-SCALES
- 6:00 pm – 6:30 pm Coffee break



**Monday, July 22, 2019 (continued)**

- 6:30 pm – 7:00 pm      Jan Genzer, NC State University, USA  
CREATING ELASTOMER AND HYDROGEL LAYERS WITH SPATIAL VARIATION OF  
CROSSLINK DENSITY
- 7:00 pm – 7:30 pm      Livia Manni ETH–Zurich, Switzerland  
BEYOND FREEZING: LOW TEMPERATURE LIPIDIC CUBIC PHASE AS BIOMIMETIC,  
NANOCONFINING MATRIX
- 7:30 pm – 9:00 pm      Dinner
- 9:00 pm – 10:00 pm    Social hour / **Poster Session**

## **Tuesday, July 23, 2019**

7:00 am – 8:30 am Breakfast buffet

### **Session 4: Polymer, Polyelectrolyte Gels and Networks**

Session Chairs: Jack Douglas, Lilian Hsiao

8:30 am – 9:00 am Surita Bhatia, Stony Brook University, USA  
SOFTER JUNCTIONS CAN RESULT IN STIFFER GELS: ASSOCIATIVE POLYMER GELS WITH CRYSTALLINE AND SEMICRYSTALLINE DOMAINS

9:00 am – 9:30 am Dave Adams, University of Glasgow, UK  
CONTROLLING AND UNDERSTANDING SINGLE AND MULTICOMPONENT SUPRAMOLECULAR GELS

9:30 am – 10:00 am Saad Khan, NC State University, USA  
FROM GELS TO AEROGELS: CREATING MULTIFUNCTIONALITY VIA SOLVENT REMOVAL

10:00 am – 10:30 am Carlos Lopez, RWTH Aachen University, Germany  
GELATION OF BIO-POLYELECTROLYTES: INTERPLAY BETWEEN BACKBONE HYDROPHOBICITY, COUNTERION SPECIFICITY AND COUNTERION VALENCE

10:30 am – 11:00 am Coffee break  
(Deadline to sign up for boxed lunch on Wednesday)

11:00 am – 11:30 am Jodie Lutkenhaus, Texas A&M University, USA  
POLYELECTROLYTE ASSEMBLIES: FUNDAMENTALS AND APPLICATIONS

11:30 am – 12:00 pm Yakov Lapitsky University of Toledo, USA  
SOFT MATERIALS FROM POLYELECTROLYTE-MULTIVALENT ION MIXTURES

12:00 pm – 12:30 pm Sarah Perry, University of Massachusetts Amherst, USA  
UNDERSTANDING THE ELECTROSPINABILITY OF COMPLEX COACERVATES

12:30 pm – 2:00 pm Lunch

2:00 pm – 4:30 pm Networking / free time / *ad hoc* sessions

### **Session 5: Responsive Systems, Hydrogels, and Colloidal Networks**

Session Chair: Jodie Lutkenhaus

4:30 pm – 5:00 pm Michael KC Tam, University of Waterloo, Canada  
RHEOLOGY AND DYNAMICS OF pH-RESPONSIVE MICROGEL SYSTEMS

5:00 pm – 5:30 pm Srinivasa Raghavan, University of Maryland, USA  
ELECTRO-RESPONSIVE HYDROGEL FILMS AND BEADS: USING ELECTRIC FIELDS TO BREAK OR STICK SOLIDS

5:30 pm – 6:00 pm Hideki Sakai, Tokyo University of Science, Japan  
 $\alpha$ -GEL FORMATION ABILITY OF MONOHEXADECYL PHOSPHATE NEUTRALIZED BY L-ARGININE

6:00 pm – 6:30 pm Coffee break

**Tuesday, July 23, 2019 (continued)**

- 6:30 pm – 7:00 pm Roger Bonnecaze, University of Texas at Austin, USA  
CONNECTION BETWEEN MICROSCOPIC DYNAMICS AND MACROSCOPIC  
PROPERTIES OF SOFT PARTICLE GLASSES
- 7:00 pm – 7:30 pm Ramon Rubio, Complutense University Madrid, Spain  
MICRORHEOLOGY OF GELS BASED ON POLYMERS AND ON DIFFERENT  
COLLOIDAL SYSTEMS
- 7:30 pm – 9:30 pm Conference Banquet

**Wednesday, July 24, 2019**

7:00 am – 8:00 am Breakfast buffet

8:00 am – 11:30 am **Session 6: Polymer, Soft Solids and Micro-gel/emulsions**

Session Chair: Sarah Perry

8:00 am – 8:30 am Jack Douglas, NIST, USA  
Knot Energy, Complexity, and Mobility of Knotted Polymers

8:30 am – 9:00 am H. Henning Winter, University of Massachusetts Amherst, USA  
RHEOLOGY OF THE COLLOIDAL GLASS TRANSITION AS COMPARED TO THE  
MOLECULAR GLASS TRANSITION AND GELATION

9:00 am – 9:30 am Mohan Srinivasarao, Georgia Tech, USA  
COLLOIDAL MICROGEL PARTICLES: CONFINEMENT OF LIQUID CRYSTALS AND  
CHARACTERIZATION

9:30 am – 10:00 am Coffee break

10:00 am – 10:30 am Lilian Hsiao, NC State University, USA  
THE COLLOIDAL MICROSTRUCTURE OF MECHANICALLY REINFORCED  
ORGANOHYDROGELS

10:30 am – 11:00 am Michael Gradzielski, TU Berlin, Germany  
RHEOLOGICAL CONTROL OF MICROEMULSIONS IS POSSIBLE BY ADMIXTURE OF  
END-CAPPED MULTI-ARM POLYMERS OF DIFFERENT FUNCTIONALITY – A  
STUDY OF STRUCTURE AND DYNAMICS

11:00 am – 11:30 am Guarav Arya, Duke University, USA  
INTERFACE-MEDIATED ASSEMBLY OF TUNABLE ANISOTROPIC NANOPARTICLE  
CLUSTERS AND PHASES

12:00 pm – 1:30 pm Lunch and departures

Boxed lunches available at 11:30am for those who signed up – Sign ups must be  
received by 11am on Tuesday, July 23

*Posters*

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## **Poster Presentations**

1. **Peptide hydrogels from twisted ribbon aggregates**  
Axel Rüter, Lund University, Sweden
2. **Large-area alginate/PEO-PPO-PEO hydrogels with thermoreversible rheology at physiological temperatures**  
Surita Bhatia, Stony Brook University, USA
3. **Cluster formation during aging of colloid-polymer dispersions and re-entrant rheological behavior at interfaces and the microscale**  
Surita Bhatia, Stony Brook University, USA
4. **Understanding affinity-driven protein uptake into ionically crosslinked chitosan micro- and nanogels**  
Yakov Lapitsky, University of Toledo, USA
5. **Desalination using polyelectrolyte hydrogels**  
Lucie Nová, Charles University, Czech Republic
6. **Shear-dependent structures of microfibrillated cellulose gels**  
Emily Facchine, North Carolina State University, USA
7. **Electrospinning complex coacervates**  
Sarah L. Perry, University of Massachusetts Amherst, USA
8. **One-pot synthesis of surface anchored network coatings**  
Jan Genzer, North Carolina State University, USA