



Newsletter

Intermediate Meeting II

DTU May 2019



01.

**DTU Technical University of Denmark**

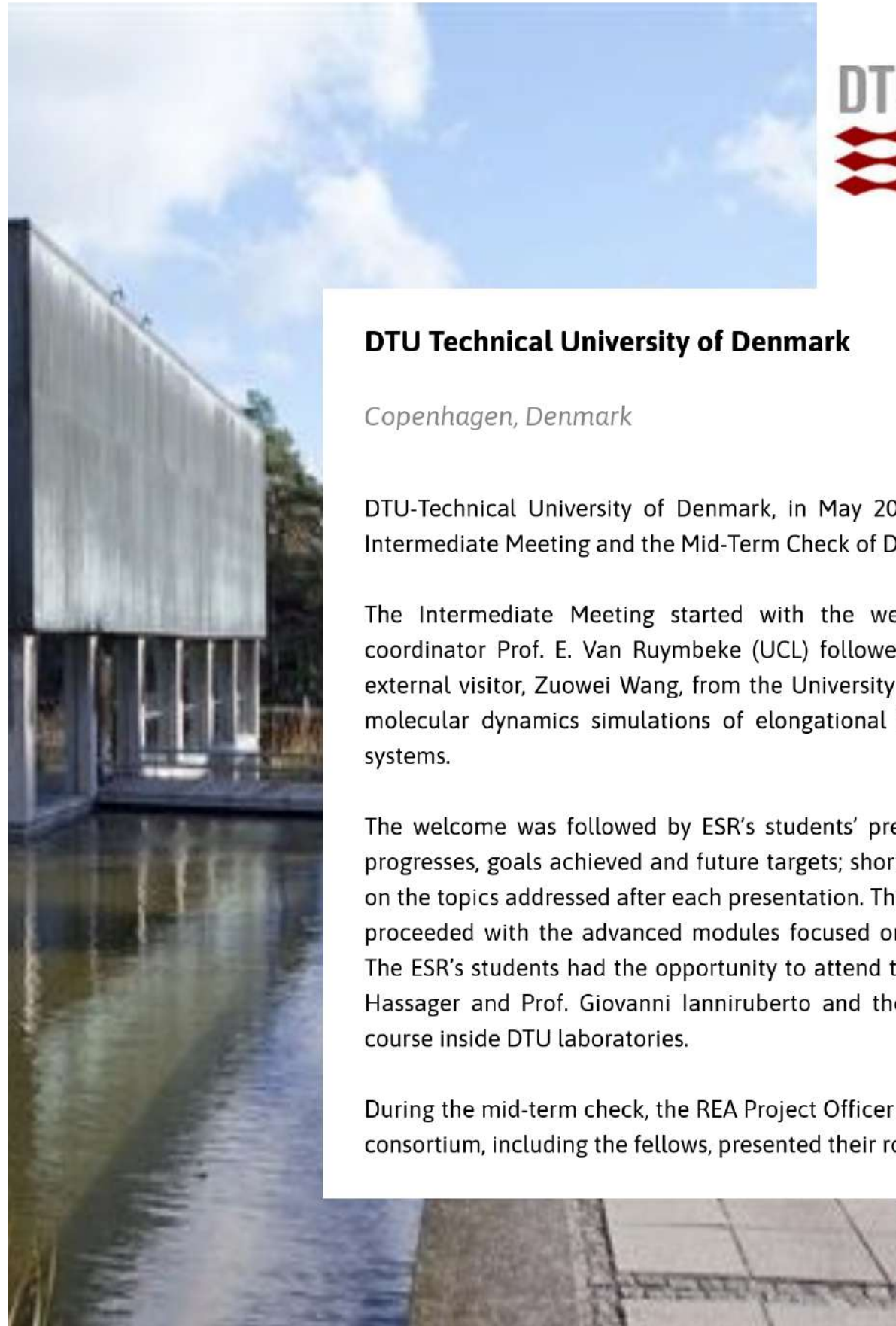
Copenhagen, Denmark

DTU-Technical University of Denmark, in May 2019, hosted the second Intermediate Meeting and the Mid-Term Check of DoDyNet group.

The Intermediate Meeting started with the welcome of the project coordinator Prof. E. Van Ruymbeke (UCL) followed by the lecture of an external visitor, Zuowei Wang, from the University of Reading (UK) about molecular dynamics simulations of elongational behavior of polymeric systems.

The welcome was followed by ESR's students' presentations about their progresses, goals achieved and future targets; short discussions were born on the topics addressed after each presentation. The intermediate meeting proceeded with the advanced modules focused on extensional rheology. The ESR's students had the opportunity to attend the lectures of Prof. Ole Hassager and Prof. Giovanni Ianniruberto and the extensional rheology course inside DTU laboratories.

During the mid-term check, the REA Project Officer and all the parts of the consortium, including the fellows, presented their roles in the project.



02.



DTU OVERVIEW



History

Founded in 1829 by the father of electromagnetism, H. C. Ørsted, with the mission of creating value for the benefit of society, DTU is an international elite technical university where education, scientific advice, and innovation rest on a solid foundation of world-class research.



Activities

DTU Chemical Engineering's main activities lie within the areas of product design, process design and production in the chemical, biotechnological, pharmaceutical, food technological and energy technological industries.



Leading role in research

Danish Polymer Center (DPC) plays an internationally leading role in the research of extensional rheology, silicone elastomers and synthesis of polymers. Our lab visit and training was hosted by DPC.

Mid-Term Check

The Mid-Term Check had the aim to evaluate the network work in all the aspects (scientific, research training, managements etc.).

Firstly, the REA project officer introduced the purpose of the meeting and depicted the rights and obligations of fellows and beneficiaries, subsequently, all the scientists in charge presented their research team and their role within the network.

The network and the management of the different aspects of the project (recruitment, deliverables, financial aspects, managements meeting, etc.) were illustrated by the project coordinator. Afterwards, all the fellows briefly presented their teams and their roles in the project. In particular, the ESR's students introduced themselves, providing information on their background, research's plan, training performed and expectation to their future career as MSCA fellows.

The presentations were followed by a restricted session between the fellows and the project officer where the fellows could give their opinions and feedbacks about the project and their team.

The mid-term meeting ended with the positive feedback of the REA project officer and general suggestions about the disseminations of the project.



The last two days of the meeting were focused on the Advanced Modules.

In the morning the following lectures were given:

Ole Hassager
DTU, Denmark

Filament Stretching Rheology: Basic Concepts
Extensional rheology of model polymers

Giovanni Ianniruberto
UNaples, Italy

Molecular models for the rheology of polymeric
networks

Lab training - Extension Rheology

In the afternoon, all ESRs had the opportunity to practice extensional rheology by doing hands-on experiment on LDPE. The objective of the lab training is to help get a better understanding of the lectures and to introduce the tool to all the ESRs. The students were divided into four groups. Each group performed linear viscoelastic measurements and nonlinear extensional rheology, followed by data analysis. Wendi Wang (ESR 6), the DTU's fellow, helped on the description of the instruments used and of the experiment performed.

In particular, the measurements were performed using ARES-G2, SER, FSR and EVF.



05.

Project Meeting

All ESRs took the opportunity to present the new research results they obtained in a few months.

We were honoured to have Zuowei Wang (University of Reading, UK) as invited lecturer for this meeting.

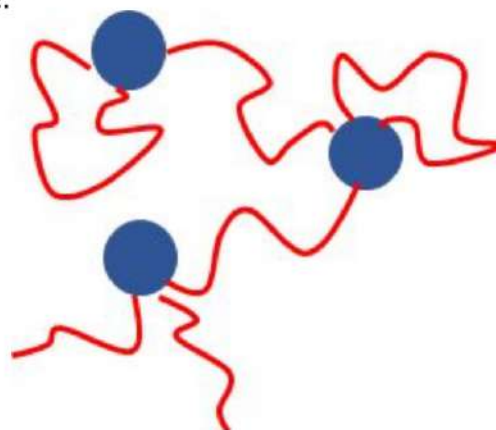
He presented a talk on an "Introduction to Molecular Dynamics Simulations of Elongational Behavior of Polymeric Systems".

ESR Presentations and work progress

Although most of the ESRs have been working on the project for less than one year, good results have already been obtained. The results can be organized in the following sections.

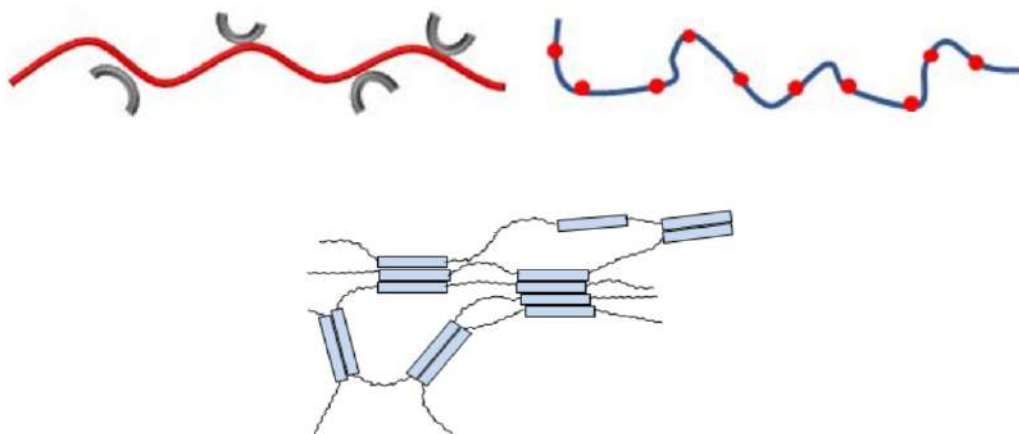
Sticky polymer chains and associative tri-block copolymers

In this section, we reported the progresses about the synthesis of copolymers of different chemistry (Larissa Hammer ESR3 and Clément Coutouly ESR1). Some dynamics studies have been also carried out, in particular, Consiglia Carillo (ESR8) focused on the investigation of phase separation phenomena on the linear copolymers provided by the ESR1, but further studies need to be done in the future.



Other diverse subjects have been studied under the category of sticky polymer chains, such as synthesis and linear rheology of PnBA-co-tpy (Clément Coutouly ESR1), linear and extensional rheology of ionomers and sticky PS chains (Wendi Wang, ESR 6), mechanical properties of associating copolymers (Simone Sbrescia, ESR 9), etc.

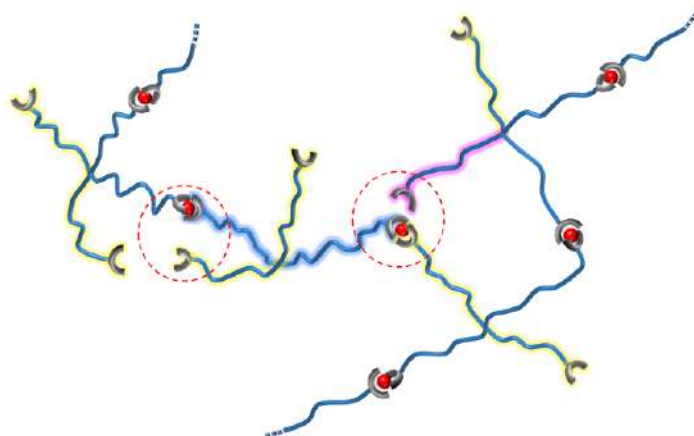
06.



Metallo-supramolecular star polymers

As showed during the section 3, the dynamics of PnBA star polymers have been studied, both in the linear regime (Yanzhao Li, ESR12) and in the nonlinear regime of shear deformation (Christina Pyromali, ESR5). The dynamics of this system have also been modelled thanks to Yanzhao Li (ESR 11).

In the same category, PEO star polymer with 1 functional groups has been prepared, the structure and diffusion have been studied by Paola Nicoletta (ESR10).



07.

Smart gels

Works about synthesis of slide-ring gels (Rowanne Lyons, ESR2) and supramolecular networks from complementary functional building blocks (Stefania Traettino, ESR4) have been investigated. They are going to be characterized by Elasto-capillary effect and diffusive wave spectroscopy (Carole-Ann Charles ESR7, Jianzhu Ju ESR13).

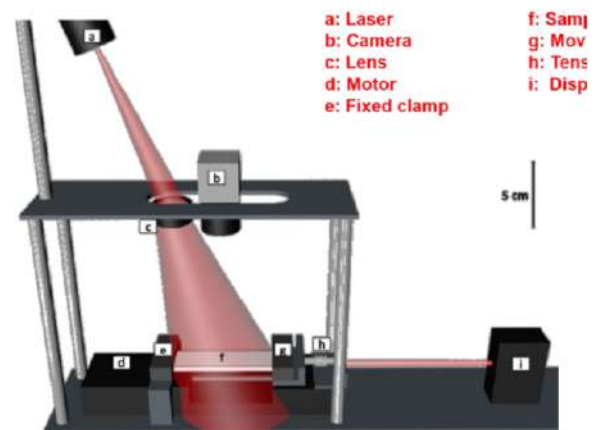
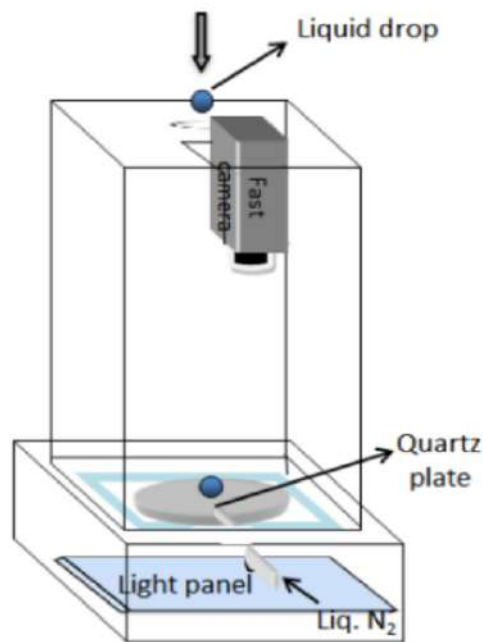


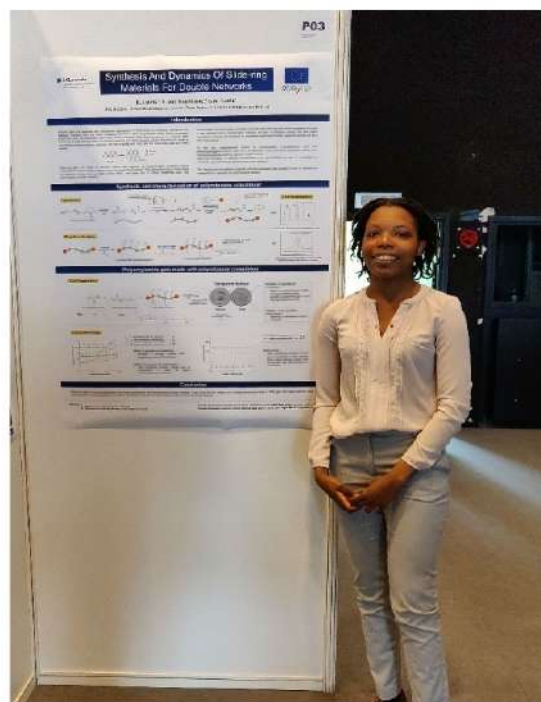
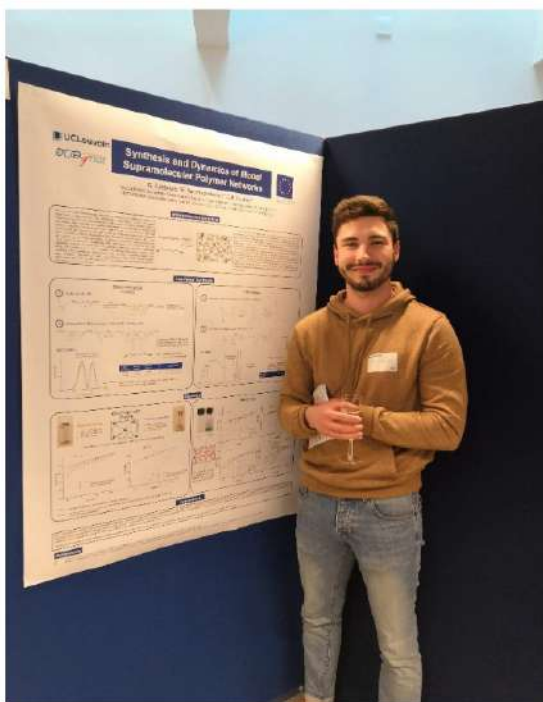
Fig. 2 Experimental set-up of DWS testing.

In the future work, these systems will be added possible covalent bonding to form DUAL NETWORK.

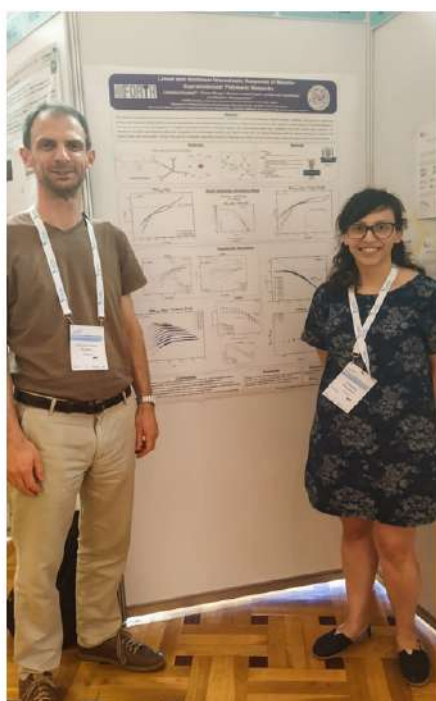
08.

The ESRs have started to participate to different events (group meeting, conferences, etc.) to disseminate their research results!

Here are some examples.



Clément Coutouly and Rowanne Lyons at the Belgium Polymer Group (BGP) conference, Houffalize, 27th of May 2019.



Christina Pyromali,
European Polymer Congress, Europe,
9th - 14th of June 2019.



Wendi Wang, Annual Polymer Day (DPC),
Coloplast, 22nd of March 2019.



Next Meeting Capri July 2019

The ESRs will have the opportunity to attend lectures about “Transient and complex polymer networks” during the Summer School in Capri, Italy, from 22nd to the 27th of July 2019.

They will also present their own work during the poster session.

See you then!

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DODYNET

Summer School on transient and complex polymer networks

22 – 27 July 2019, Capri, Italy



The DoDyNet Summer School will be held from the 22nd to the 27th of July 2019, on the beautiful island of Capri.

The school aims to explore all aspects of polymer networks containing supramolecular junctions or several dynamics of association.

The school is addressed to students and researchers both from industry and academic institutions, and is open to all with an interest in this field.

Participants will also have an opportunity to present their own work during poster sessions.

Organisers

The summer school is organized by Prof. Giovanni Ianniruberto, (Dipartimento di Ingegneria chimica, dei Materiali e della Produzione industriale, Università Degli Studi di Napoli Federico II) and Prof. Evelyne van Ruymbeke (Bio- and Soft-Matter, Université catholique de Louvain). This project has received funding from the European Union as an Innovative Training Networks under the H2020 Marie Curie Actions programme.

Confirmed Invited Speakers

- Ralph Colby (Penn State University, USA)
- Salvatore Coppola (Versalis, Italy)
- Emanuela Del Gado (Georgetown University, USA)
- Emmanouela Filippidi (University of California, USA)
- Jian Ping Gong (Hokkaido University, Japan)
- Giuseppe Marrucci (Naples University, Italy)
- Yuichi Masubuchi (Nagoya University, Japan)
- Bradley Olsen (MIT, USA)
- Daniel Read (University of Leeds, United Kingdom)
- Michael Rubinstein (Duke University, USA)
- Ilja Voets (Eindhoven University of Technology, The Netherlands)
- Zuowei Wang (University of Reading, United Kingdom)
- Hiroshi Watanabe (Kyoto University, Japan)

Registration fee

- 300€ this includes all course materials, coffee breaks and lunches, as well as a social dinner
- Note that places are limited to 70 participants, please register early
- Registration at <https://www.dodynet.eu/capri-summer-school-july-2019/registration/>
- Deadline for registration: 29 April 2019
- Deadline for poster submission: 14 June 2019
- Please book your accommodation as soon as possible – July is peak tourist season on the island
- Contact: iannirub@unina.it or dodynet-manager@uclouvain.be