Prof. Evelyne van Ruymbeke

Bio and Soft Matter, IMCN
Université catholique de Louvain
Louvain-La-Neuve, Belgium

Born on March 2nd 1977, Married, with three children.

- **EDUCATION**

During my PhD, I took advantage of my unusual background in both Applied Mathematics and Materials Sciences to work between the two corresponding institutes: I developed new mesoscopic models able to predict the viscoelastic properties of entangled model polymers and confronted the theoretical results to my experimental data.

2005 PhD. In Applied Mathematics – *Relationship between molecular structure and linear viscoelasticity for mixtures of linear and star polymers*.
Pôle en Ingénierie mathématique (INMA), Université catholique de Louvain, Belgium
Supervisors: Profs. Roland Keunings (INMA) and Christian Bailly (POLY)

2000 Master in Applied Mathematics (Major) and in Materials Sciences (Minor), with highest honours. Faculté des Sciences Appliquées, Université catholique de Louvain, Belgium

- **CURRENT POSITION**

Oct. 2012 – (Permanent) Research Associate of the FNRS (Chercheur Qualifié) and Chargé de cours at UCL, Bio and Soft Matter, Université catholique de Louvain, Belgium

- **PREVIOUS POSITIONS**

The overall objective of my research is to measure, reveal and model the rheological behavior of soft materials in order to build predictive tools aimed at linking molecular structure to flow, and eventually design novel materials with desired properties. During my post-doc in the group of Prof. D. Vlassopoulos, I studied the flow properties of soft colloidal systems and created a general approach to predict the rheology of architecturally complex macromolecules. Then, as 'chargé de recherche' in my university, I have continued to develop this model and have extended it to nonlinear flow. As research scientist in the company DSM, I broadened both my knowledge area and thinking about possible applications. I also completed my model with a statistical approach, which allows me to link synthesis recipe to chain architectures. I am presently using all this knowledge towards the understanding and modelling of the dynamics of supramolecular polymers.

2011 – 2012 Scientist in Polymer Rheology and processing at the Research department (Materials Sciences Centre) of DSM Ahead, Geleen, The Netherlands.

2008 – 2011 Research Associate of the FNRS (Chargé de recherche),
Bio and Soft Matter, Université catholique de Louvain, Belgium

2007 – 2008 Research Associate of the FNRS (Chargé de recherche), IESL, FORTH, Heraklion, Greece

- **FELLOWSHIPS**

2005 – 2007 Individual EIF Marie Curie fellowship (DYCOSYS – on the dynamics of soft colloidal systems), IESL, FORTH, Heraklion, Greece

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2012 – 2 Postdoctoral fellows, 4 PhD students and 5 Master Students

Bio and Soft Matter, Université catholique de Louvain, Belgium

2005 – 2011 2 PhD students and 5 Master Students
IESL, FORTH, Heraklion, Greece
Bio and Soft Matter, Université catholique de Louvain, Belgium

- **TEACHING ACTIVITIES**

2012 – Main titular – Rheology - Université catholique de Louvain, Belgium
2012 – Co-titular – Rheometry - Université catholique de Louvain, Belgium
2012 – Co-titular – Polymer Engineering - Université catholique de Louvain, Belgium
2005 – Several short courses on polymer rheology, in Erasmus Mundus Program (Eurheo) or schools (Juelich (Germany), Utrecht (The Netherlands), Maastricht (The Netherlands).

- **ORGANISATION OF SCIENTIFIC MEETINGS**

2013 - As coordinator of a European Marie Curie ITN (Supolen) which involve 12 institutions, I have to organize many networks meetings and summer school. I will also organize the final, international conference (Brussels, 2017).
2013 Member of the organizing committee for the Annual meeting of the European Society of Rheology (AERC) in Leuven
2016 Organizer (for the Belgian side) of the join conference of the Belgian and French Groups of Rheology, which will be held in Lille (Oct. 2016).
2011 As secretary of the Belgian Group of Rheology, organizer of the annual meeting of the BGR.

- **COMMISSIONS OF TRUST**

2015 –2018 Jury member for the Bingham award of the Society of Rheology
2015 – Editorial Board of the review *Rheologica Acta*
2013 – Responsible of the session "polymer melts and solutions" in several conferences (AERC, Leuven 2013, Belgium – AERC 2015, Nantes, France – ICR 2016, Kyoto, Japan)
2015 – Scientific Evaluation for the NWO (Vici program), The Netherlands.
2008 – Reviewer for many international journals (such as *Macromolecules, Journal of Rheology, Soft Matter, Physics Review Letters, Journal of Non Newtonian Fluids mechanics*)

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2015 – Representative member of the European Society of Rheology
2013 – Member, as coordinator, Research ITN Network "*Supolen"*
2013 – Member, as representative of UCL, Research Network "*SoftComp"*
2011 – Member and secretary of the Belgian Group of Rheology
2008 – 2012 Member, Research Network ITN "*Dynacop*"
2010 – Member of the Society of Rheology

- **ON GOING GRANTS**

  - Coordinator of the European Marie-Curie ITN "Supolen" on the structure and dynamics of supramolecular entangled polymers (3.9MEuros, 12 institutions)
  - Supervisor of two PhD grants from FNRS - FRIA

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2015 – Representative member of the European Society of Rheology
2013

- **CAREER BREAKS**

During my thesis and post-doctoral research, I have three children (born on 15th July 2002, 1st March 2004 and 20th August 2008).

- **PUBLICATIONS AND PRESENTATIONS**

- Author of 39 papers, with 859 citations (H factor: 16, I factor: 24).
- Presentation of my work to more than 100 international conferences.

Papers with Peer reviews in major international scientific journals

1. L.G.D. Hawke, M. Ahmadi, H. Goldansaz and E. van Ruymbeke, Viscoelastic properties of linear associating poly(n-butyl acrylate) chains, accepted in Journal of Rheology, 2016.

2. M Ahmadi, LGD Hawke, H Goldansaz, E van Ruymbeke, Dynamics of entangled linear supramolecular chains with sticky side groups: influence of hindered fluctuations, accepted in Macromolecules, 2015

3. H. Goldansaz, Q. Voleppe, S. Pioge, C.A. Fustin, J.F. Gohy, J. Brassinne, E. van Ruymbeke, Controlling the melt rheology of linear entangled metallo-supramolecular polymers, Soft Matter, EMERGING INVESTIGATORS THEMED ISSUE, 11 (4), 762, 2015.

4. H. Goldansaz, F. Goharpey, F. Afshar-Taromi, I. Kim, F. Stadler, E. van Ruymbeke, V. Karimkhani, Anomalous Rheological Behavior of Dendritic Nanoparticle/Linear Polymer Nanocomposites. Macromolecules, 48, 3368, 2015.

5. A. Shabbir, H. Goldansaz, O. Hassager, E. van Ruymbeke, N. Alvarez, Effect of Hydrogen Bonding on Linear and Nonlinear Rheology of Entangled Polymer Melts, Macromolecules, 48(16), 5988, 2015.

6. H. Goldansaz, E. van Ruymbeke, J.F. Gohy, C.A. Fustin, M. Ries, C. Bailly, Local Molecular Dynamics and Heterogeneity in PEO– NiCl2Supramolecular Networks. Macromolecules, 48, 2290, 2015.

7. H. Goldansaz, D. Auhl, B. Goderis, Q. Voleppe, C.A. Fustin, J.F. Gohy, C. Bailly, E. Van Ruymbeke, Transient Metallosupamolecular Networks Built from Entangled Melts of Poly(ethylene oxide). Macromolecules, 48, 3746, 2015.

8. E van Ruymbeke, V Schetnikava, Y Matsumiya, H Watanabe, Dynamic dilution effect in binary blends of linear polymers with well-separated molecular weights, Macromolecules 47(21), 7653-7665, 2014.

9. V Shchetnikava, JJM Slot, E van Ruymbeke, A Comparison of Tube Model Predictions of the Linear Viscoelastic Behavior of Symmetric Star Polymer Melts, macromolecules, 2014.

10. ME Shivokhin, E Van Ruymbeke, C Bailly, D Kouloumasis, N. Hadjichristidis, A.E. Likhtman, Understanding Constraint Release in Star/Linear Polymer Blends, Macromolecules 47 (7), 2451-2463, 2014.

11. E van Ruymbeke, H Lee, T Chang, A Nikopoulou, N Hadjichristidis, F. Snijkers, D. Vlassopoulos, Molecular rheology of branched polymers: decoding and exploring the role of architectural dispersity through a synergy of anionic synthesis, interaction chromatography, rheometry and modeling, Soft Matter, 2014.

12. Y. Matsumiya, Y. Masubuchi, T. Inoue, O. Urakawa, C.Y. Liu, E. van Ruymbeke, H. Watanabe, Dielectric and Viscoelastic Behavior of Star-Branched Polyisoprene: Two Coarse-Grained Length Scales in Dynamic Tube Dilation. Macromolecules, 47, 7637, 2014.

13. H Watanabe, Y Matsumiya, E Van Ruymbeke, Component Relaxation Times in Entangled Binary Blends of Linear Chains: Reptation/CLF along Partially or Fully Dilated Tube, Macromolecules 46 (23), 9296-9312, 2013.

14. J Brassinne, AM Stevens, E Van Ruymbeke, JF Gohy, CA Fustin, Hydrogels with Dual Relaxation and Two-Step Gel–Sol Transition from Heterotelechelic Polymers, Macromolecules 46 (22), 9134-9143, 2013.

15. E Van Ruymbeke, JJM Slot, M Kapnistos, PAM Steeman, Structure and rheology of branched polyamide 6 polymers from their reaction recipe, Soft Matter 9 (29), 6921-6935, 2013.

16. JJM Slot, E Van Ruymbeke, PAM Steeman, Composition and rheology of polyamide-6 obtained by using bi-and tri-functional coupling agents, Chinese Journal of Polymer Science 31 (1), 58-70, 2013

17. E. van Ruymbeke, Y. Masubuchi, H. Watanabe, Effective Value of the Dynamic Dilution Exponent in Bidisperse Linear Polymers: from 1 to 4/3, Macromolecules, 45, 2085-2098, 2012.

18. F. Snijkers, E. van Ruymbeke, P. Kim, H. Lee, A. Nikopoulou, T. Chang, N. Hadjichristidis, J. Pathak, D. Vlassopoulos, Architectural Dispersity in Model Branched Polymers: Analysis and Rheological Consequences, Macromolecules, 44 (21), 8631-8643, 2011.

19. M. Ahmadi, C. Bailly, R. Keunings, M. Nekoomanesh, E. van Ruymbeke, Time Marching Algorithm for Predicting the Linear Rheology of Monodisperse Comb Polymer Melts, Macromolecules, 44 (3), 647-659, 2011.

20. E. van Ruymbeke, EB. Muliawan, D., H. Gao, K. Matyjaszewski, Melt rheology of star polymers with large number of small arms, prepared by crosslinking poly(n-butyl acrylate) macromonomers via ATRP, European Polymer Journal, 4, 746-751, 2011.

21. E. van Ruymbeke, D. Vlassopoulos, M. Kapnistos, CY. Liu, C. Bailly, Proposal to Solve Time-Stress Discrepancy of Tube Models, Macromolecules, 43,525-531, 2010.

22. E. van Ruymbeke, A. Pamvouxoglou, D. Vlassopoulos, G. Petekidis, G. Mountrichas, S. Pispas, Stable responsive diblock copolymer micelles for rheology control, Soft Matter, 6, 881-891, 2010.

23. E. van Ruymbeke, L. Balacca, S. Coppola, S. Righi, D. Vlassopoulos, Decoding the viscoelastic response of polydisperse star/linear polymer blends, Journal of Rheology, 54, 507-538, 2010.

24. E. van Ruymbeke, D. Vlassopoulos, M. Mierzwa, T. Pakula, D. Charalabidis, M. Pitsikalis, and N. Hadjichristidis, Rheology and Structure of Telechelic Linear and Star Polyisoprene Melts, Macromolecules, 43, 4401-4411, 2010.

25. PUBLICATION AWARD OF THE SOCIETY OF RHEOLOGY, 2011: E. van Ruymbeke, E. B. Muliawan, T. Watanabe, S. G. Hatzikiriakos, A. Hirao, D. Vlassopoulos, Viscoelasticity and extensional rheology of model Cayley-tree polymers of different generations, Journal of Rheology, 54, 642-662, 2010.

26. E. van Ruymbeke, J. Nielsen, O. Hassager, Non-linear rheology of bidisperse linear polymers: mixing law and tube pressure effects, Journal of Rheology, 54, 1155-1172, 2010.

27. FJ. Stadler, E. van Ruymbeke, An Improved Method to Obtain Direct Rheological Evidence of Monomer Density Reequilibration for Entangled Polymer Melts, Macromolecules, 43, 21, 9205-9209, 2010.

28. J.T. Padding, E. van Ruymbeke, D. Vlassopoulos and W.J. Briels, Computer simulation of the rheology of concentrated star polymer suspensions, Rheol. Acta, 49, 473-484, 2010.

29. H. Watanabe; Y. Matsumiya; E. van Ruymbeke, D. Vlassopoulos, N. Hadjichristidis, Viscoelastic and dielectric relaxation of a Cayley-tree-type polyisoprene: Test of molecular picture of dynamic tube dilation, Macromolecules 41, 16, 6110-6124, 2008.

30. E. van Ruymbeke, K. Orfanou, M. Kapnistos, H. Iatrou, M. Pitsikalis, N. Hadjichristidis, D. J. Lohse, and D. Vlassopoulos, Entangled dendritic polymers and beyond: Rheology of symmetric Cayley-tree polymers and macromolecular self-assemblies, Macromolecules, 40, 5941-5952, 2007.

31. E. van Ruymbeke, M. Kapnistos, D. Vlassopoulos, TZ Huang, DM Knauss, Linear melt rheology of pom-pom polystyrenes with unentangled branches, Macromolecules 40 (5): 1713-1719, 2007.

32. E. van Ruymbeke, C. Bailly, R. Keunings, D. Vlassopoulos, A general methodology to predict the linear rheology of branched polymers, Macromolecules 39 (18): 6248-6259, 2006.

33. E. van Ruymbeke, A. Kaivez, A. Hagenaars, D. Daoust, P. Godard, R. Keunings, C. Bailly, Characterization of sparsely long chain branched polycarbonate by a combination of solution, rheology and simulation methods, Journal of Rheology, 50 (6): 949-973, 2006.

34. C.Y. Liu, J.S. He, E. van Ruymbeke, R. Keunings, C. Bailly, Evaluation of different methods for the determination of the plateau modulus and the entanglement molecular weight, Polymer, 47 (13): 4461-4479, 2006.

35. E. van Ruymbeke, V. Stéphenne, D.Daoust, P. Godard, R. Keunings, C. Bailly, New Method to detect very low levels of Long Chain Branching in High Density Polyethylene, Journal of Rheology, 49(6), 1503-1520, 2005.

36. E. van Ruymbeke, R. Keunings, C. Bailly, Prediction of linear viscoelastic properties for polydisperse mixtures of entangled star and linear polymers: Modified tube-based model and comparison with experimental results, J. Non-Newtonian Fluid Mech., Vol. 128, 7-22, 2005.

37. E. van Ruymbeke, R. Keunings, V. Stéphenne, A. Hagenaars, C. Bailly, Evaluation of Reptation Models for Predicting the Linear Viscoelastic Properties of Entangled Linear Polymers, Macromolecules, Vol. 35, 2689-2699, 2002.

38. E. van Ruymbeke, R. Keunings, C. Bailly, Determination of the Molecular Weight Distribution of Entangled Linear Polymers from Linear Viscoelasticity Data, J. Non-Newtonian Fluid Mech., Vol. 105, 153-175, 2002.

Book chapter :

Quantitative tube model predictions for the linear viscoelasticity of linear polymers, E van Ruymbeke, CY Liu, C Bailly, Rheology Reviews **2007**, 53–134 (11 citations).

Invited presentations to peer-reviewed, internationally established conferences (selection)

- van Ruymbeke, E.. *Modeling the viscoelastic properties of binary blends of linear and star polymers*, MACRO 2016, 46th IUPAC World Polymer Congress, July 17-21, 2016.

- van Ruymbeke, E.. *Rheology of complex polymer melts: from their composition to their viscoelastic properties*. IBEREO 2015 (Coimbra, 07/09/2015 - 09/09/2015).

- van Ruymbeke, E. *Dynamics of metallo-suprramolecular entangled polymer melts*. Institute for Chemical Research International Symposium 2014 (Kyoto, Japan, from 10/03/2014 to 12/03/2014).

- van Ruymbeke, E. *Rheology of complex polymer melts: from their composition to their viscoelastic properties*. 48e Congres du groupe francais de rhéologie (Nantes, France), 2013.

- van Ruymbeke, E.; Slot, J. ; Steeman, P.. *Rheology and morphology of polyamide melts: prediction based on formulation*. The 10th International Symposium on Polymer Physics, PP' 2012 (Chengdu, China, du 04/06/2012 au 08/06/2012).

- van Ruymbeke, E.; Charalabidis, D ; Pitsikalis, M ; Hadjichristidis, N ; Vlassopoulos, D. *Rheology and Structure of Telechelic Linear and Star Polyisoprene Melts*. 2nd International Soft Matter Conference" (ISMC2010) (Granada, Spain, from 05/07/2010 to 08/07/2010).

Prizes and Awards:

2005–2007: Marie Curie Individual European Fellowship *DYCOSYS*

2007: Laureate of the Chemical European Science and Engineering Award 2007, ExxonMobil

2011: Best Publication award of the Journal of Rheology

2013-2017: Coordination of a Marie Curie Initial Training Network (*SUPOLEN*)