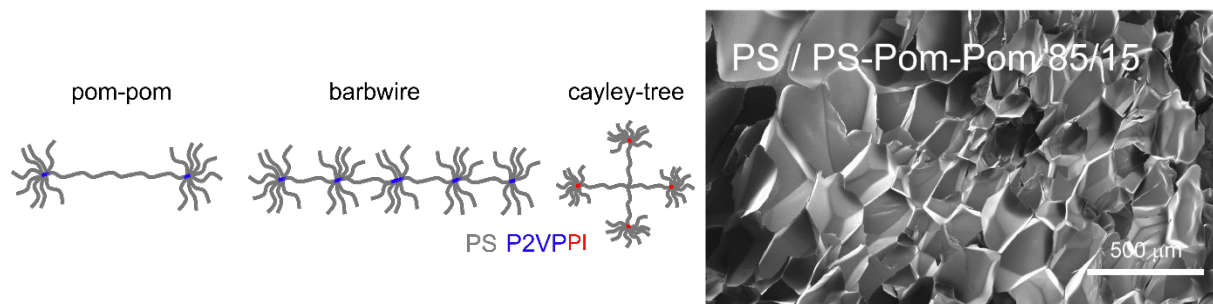


2 PhD Positions in Polymer Chemistry (TU Clausthal) and Polymer Processing (TU Dortmund) in a 3 years DFG Project

“Influence of topology of well-defined branched polymers on foam extrusion and mechanical properties of polymer blends”

The objective of our joint project is the development of the next generation high-performance closed-cell extrusion foams by tuning the melt rheological properties via design of the molecular polymer architecture. The project covers the synthesis of branched polymer polystyrene and bio-based polylactic acid model systems for the use as additives to commercial polymers or recyclates as well as the polymer processing and optimization of the foam properties. Therefore, we are offering PhD positions in the group of Prof. Hirschberg (Sustainable Polymer Materials) at TU Clausthal and in the group of Prof. Handge (Chair of Plastics Technology) at TU Dortmund University.

Processing and application properties of polymer materials originate from the polymer architecture. Branched polymers with a so-called pom-pom architecture (two stars which are covalently linked by a linear chain, pom-pom polymers) have exactly two branching points, yielding excellent melt strength. Consequently, pom-pom polymers are ideally suited to tailor processing by means of foam extrusion if they are used as an additive. In particular, closed cell polymer foams with a very low density ($\rho < 0.04 \text{ g/cm}^3$) can be prepared with low additive concentrations of these branched polymers.



A main objective is the up-scaling of the synthesis of well-defined branched polymers by means of anionic polymerisation with a yield in the range of more than 100 g for engineering applications. Furthermore, we investigate in detail the influence of well-defined branched polymers on the rheological properties of polymer blends and the extruded foams. The results will promote the development of high-performance additives for the production of closed cell polymer foams and will enhance up-cycling of polymer recyclates.

Are you interested in this exciting project? We are looking forward to your application. Please send your application with the relevant documents (cover letter, CV, certificates) by email (in a single PDF file) to Prof. Dr. Valerian Hirschberg (valerian.hirschberg@tu-clausthal.de) if you are a chemist or to Prof. Dr. Ulrich Handge (ulrich.handge@tu-dortmund.de) for the engineering position.