

Green frontrunner in polymer chemistry Katja Loos knighted

Katja Loos (Frankfurt am Main, 1971), Professor of Polymer Chemistry at the Faculty of Science and Engineering of the University of Groningen, has been appointed Knight of the Order of the Netherlands Lion. She received this honour from Mayor K. Schuiling at the Groningen City Hall.

As *the* leading frontrunner in polymer chemistry in the Netherlands, Katja Loos has conducted high-level research with impressive scientific and social impact. Having obtained her PhD at the University of Bayreuth (Germany) in 2001 and after a period as a postdoctoral researcher in Brooklyn (US), Loos became an Assistant Professor at the University of Groningen in 2003 and Professor of Polymer Chemistry in 2012. Her entire career has been devoted to fundamental research aimed at reducing plastic waste by developing biodegradable or recyclable plastics, based on renewable instead of fossil fuel-based raw materials.

A green lifecycle for plastics

In her research, Loos has shown that it is possible to make the life-cycle of plastics greener by opting for an integrated approach using renewable raw materials, minimal waste during production, the smallest possible CO² footprint, and end products which are biodegradable or recyclable. She has shown that it is possible to replace metal-containing catalysts, which are used in the production processes of traditional plastics, with enzymes, nature's catalysts. Completely green production routes can be designed using enzymatic polymerization, based on renewable raw materials, green solvents, and molecular design principles for the circular economy. Four of her patents are now used by BASF, the largest chemicals company in the world, to make green emulsifiers for shampoos, cosmetics, and paints.

A revolution is PET bottles

Loos recently achieved a major scientific breakthrough with the development of a green alternative to polyethylene terephthalate or PET. PET is used in huge quantities for the production of petroleum-based soft drink bottles. Her 'bioPET' is expected to lead to an unprecedented revolution in the world of plastics. Together with researchers from Stenden University of Applied Sciences, she also developed a recyclable bioplastic membrane based on malic acid, which permits the removal of oil pollution from water. Meanwhile, the demand for completely green products and production processes has increased sharply due to new EU guidance on reducing single-use plastics and plastic bags. The social impact of her research will therefore only increase in the coming years.

The Loos school

Since coming to Groningen, Loos has taken the lead in modernizing the specialized polymer science department, established new research programs and invested heavily in an international network of polymer scientists. Her inspiring work has created a truly Loos school within polymer chemistry. As an expert in polymers, she frequently appears in various media. Her work in the field of PET alternatives in particular has attracted a lot of media attention. She is also a strong advocate for diversity and a supporter of programmes for more women in academic leadership. She is of great importance to the Northern Netherlands as a champion of this region as the circular plastic hub of Europe.

Enzymes as natural catalysts

As the second most cited researcher in her field worldwide, she has gained global recognition for Dutch polymer science. She won two German travel grants and broadened her knowledge as a visiting researcher in Brazil and the United States. Thanks to prestigious NWO Vidi and Vici grants, she was able to develop a unique research approach, using enzymes to produce green polymers and polymers with special properties. She has also held several visiting professorships in Spain and Germany and received a number of special awards, such as the *Distinguished Woman in Chemistry Award* for proven excellence in research and teaching and leadership in the chemical sciences.

Connecting and bridging

Loos is a pre-eminent a builder of networks and the driving force behind many academic and social agendas. She is the driving force behind countless partnerships, where she brings together people to bridge the entire knowledge chain from fundamental research to the projects and policies of universities and colleges, via sector organizations and research institutes to companies and provinces. In this she works closely with both large industrial companies and regional SMEs. In the Northern Netherlands she was one of the founders of the hybrid Biopolymer and Recycling Innovation department, where the UG and NHL Stenden collaborate on technology development at the Chemport Campus Emmen. Internationally, she represents the Netherlands as the president of the European Polymer Federation and as a member of many international panels and committees, such as the international working group on the biodegradability of plastics in the environment.

Inspirational teacher and mentor

In addition to her impressive track record as an excellent researcher and networker, Loos gladly makes time for teaching. She enthusiastically teaches Bachelor's and Master's students from the University of Groningen, NHL Stenden University of Applied Sciences, and Windesheim University of Applied Sciences, and has developed and coordinated the University of Groningen's *High Tech Systems and Materials* Master's Honours programme. She inspires her students, PhD candidates, and postdocs to contribute to fundamental research linked to the societal challenge of realizing a sustainable future, and prepares them for a wide range of careers. Her students and PhD candidates praise her selfless and enthusiastic support as a teacher and mentor.