

Faculty of Science and Engineering

Profile report: Tenure Track assistant professor in functional molecular materials (Functionele Moleculaire Materialen)

- Discipline: *Organic chemistry, functional materials*
- Level: tenure-track Assistant professor
- Fte: Full time (1.0)

1. Scientific discipline

The assistant professor position in functional molecular materials is positioned in the area of organic chemistry. The design, synthesis and study of properties of organic materials is a core activity of the discipline chemistry. Functional and responsive materials, based on molecular and supramolecular approaches, are among the frontiers of chemistry and are of major future scientific and industrial importance. The new position will strengthen the position of the Stratingh Institute as an international leading institute for research and education in this emerging field.

2. Vacancy

This position is opened by the Board of the Faculty (ref. JK/gl/17/01066) and will be embedded in the Stratingh Institute for Chemistry, basic unit Systems Chemistry. The position falls within the framework of 'Career Paths in Science 4' ('Bèta's in Banen 4'). Please see link for [criteria and conditions](#).

3. Selection committee (BAC)

Prof. Dr. A.J. Minnaard, director of the Stratingh Institute, CBBC-fellow, Chair
Prof. Dr. B.L. Feringa, Stratingh Institute/chair executive board ARC-CBBC
Prof. Dr. S.R. Harutyunyan, Stratingh Institute, CBBC-fellow
Prof. Dr. N. Katsonis, University of Twente, CBBC-fellow
Prof. Dr. W.R. Browne, Stratingh institute, CBBC-fellow
Prof. Dr. S. Otto, Stratingh Institute, CBBC-Fellow, director of the Master Chemistry
D. Duijnstee, Student member, Master Chemistry
Added: L. Boomsma, HR, and Prof. Dr. M. Tromp (Zernike Institute of Advanced Materials) as an advisor.

4. Research area

The research area covers synthetic chemistry, physical organic chemistry, supramolecular chemistry, and organic materials in particular for functional and responsive materials and surfaces. The new position is embedded in the RUG hub of the national ARC CBBC and will focus on materials and coatings. The field of functional organic materials with responsive and adaptive behavior for future industrial application is rapidly emerging worldwide with major applications (e.g. functional coatings, sensing, energy storage, biomedical materials, self-healing/cleaning). The new position will be complementary to the present synthesis and materials groups taking advantage of the unique position that groups within the Stratingh institute for Chemistry have gained internationally. It provides

also a direct way to strengthen academic –industrial cooperation via ARC-CBBC aiming at functional and smart materials with the multinationals Shell, AKZO-NOBEL and BASF. Taking advantage of the combined expertise in system chemistry, as part of the national gravitation program Functional Molecular Systems (FMS, fmsresearch.nl) and in surface science (as part of the Zernike+ program), the new activities will position Groningen as a highly visible international expert center in functional materials.

5. Embedding: institute (and base unit)

The Stratingh Institute for Chemistry focuses on research in molecular and supramolecular chemistry, with overarching impact on biology, chemical engineering, and physics based on fundamental organic and inorganic chemistry. It covers three research areas:

- Chemistry of Life: This area concentrates on a molecular approach to the study of biological phenomena and medicinally relevant problems, including the synthesis of complex natural products, the design and synthesis of small molecules to study and steer biochemical and cellular processes, and emerging properties like self-organisation and catalysis, including life itself.
- Chemical Conversion: This area investigates new synthesis and catalysis methods, including asymmetric catalysis and oxidation catalysis, designing artificial enzymes for new-to-nature reactions, the use of bio-based feedstocks and development of sustainable processes, and homogeneous catalysis methods using earth-abundant metals.
- Chemistry of Materials: This area covers various topics in nanoscience with a focus on advanced functional materials, such as molecular switches and motors, photovoltaics, functional polymers, molecular electronics, supramolecular materials, functional surfaces and artificial membrane components.

6. Local and (inter)national position

The position is one of the main pillars of the University of Groningen hub of the national Advanced Research Center Chemical Building Blocks Consortium ARC-CBBC (arc-cbbc.nl). The new group will closely cooperate with the other CBBC groups, groups in the Stratingh Institute, and potentially groups in the Zernike Institute of Advanced Materials, in order to establish a major expertise center for responsive organic materials and functional coatings at the University of Groningen.

The Stratingh Institute for Chemistry has built over the years an extensive collaboration network nationally and worldwide. Research groups within the Stratingh Institute take part in national research consortia, e.g., the Gravitation Program Functional Molecular Systems, ARC-CBBC – Advanced Research Center Chemical Building Blocks Consortium, the Origins Center and in local research networks such as the CoFund program ALERT and the FOM-FOCUS group Organo Photovoltaics. The Stratingh institute has a long tradition of cooperative projects with industry (DSM, Unilever, AKZO-NOBEL, Shell, Solvay) and participates in many international projects (e.g. Harvard Univ., Univ. of Leuven, ECUST Shanghai, Nagoya Univ., EMPA Zurich, Univ. Bologna, Univ. Colorado, UCLA, Univ. Tokyo).

The Stratingh Institute has an excellent (inter-)national position in synthetic chemistry and catalysis and in the Dutch chemical landscape recognized as a stronghold for synthesis. Members of the Stratingh Institute were among the founding fathers of ARC-CBBC and recognized among the three hubs (Utrecht, heterogeneous catalysis; Eindhoven, chemical engineering; Groningen, synthesis, homogeneous catalysis, materials). Other important activities in the field of organic materials are partly organized in FMS, and furthermore at Delft Technical University (Prof. Van Esch, Prof. Eelkema) and the University of Twente (Prof. Jonkheijm).

7. Expected contributions to research

The candidate is expected to build her/his own research group in the field of functional molecular materials through the design, synthesis, and physical characterization of molecular based systems, and establish a strong and internationally recognized center of expertise in this field. Cooperative research programs will be established within the Stratingh institute, with ARC-CBBC partners and with industry. In addition, through combining current expertise in synthesis, physical organic chemistry and supramolecular chemistry with new research lines in responsive and adaptive functional materials research, the candidate will create a strong position in molecular materials in the institute. Obtaining substantial extramural funding is key to attaining the above objectives.

8. Expected contributions to teaching

The candidate will teach in particular in the BSc Chemistry & Chemical Engineering, in the Master Chemistry and in the topmaster Nanoscience. Supervision of bachelor and master students in their research projects is also part of the teaching contribution.

9. Expected contributions to the organization

The candidate is expected to have an active interest and to provide a positive contribution to the management and organizational tasks of the institute. At the level of the FSE, the candidate will contribute to the organization of the faculty, for example by participating in working groups and committees, in the fields of teaching, research and management. The candidate will participate in relevant national and international organizations.