

Faculty of Science and Engineering

Profile report: Tenure track assistant professor position on molecular materials chemistry (*Chemie van materialen*)

- Discipline: *Organic-materials chemistry*
- Level: *tenure-track assistant professor/ associate professor by special appointment*
- Fte: 1.0

1. Scientific discipline

Organic-materials chemistry is primarily concerned with the synthesis of organic and eventually organic-inorganic hybrid molecular materials that exhibit useful properties in the solid-state. This discipline exemplifies the central role of Chemistry in the natural sciences and often occurs at the interface with other scientific disciplines. A key feature is the application of synthetic chemistry to control the form and function of materials, be they mechanical, electrical, (electro)magnetic, optical, etc. This position will complement the existing materials-oriented research and education in the Stratingh Institute for Chemistry and its interaction with recent additions in the area of functional and responsive materials and surfaces.

2. Vacancy

This position is opened by the Board of the Faculty of Science and Engineering and will be embedded in the Stratingh Institute for Chemistry, basic unit 'Chemistry of (Bio)organic Materials and Devices'. 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, Chair
Prof. Dr. R.C. Chiechi, Stratingh Institute
Prof. Dr. S. Harutyunyan, Stratingh Institute
Prof. Dr. W.R. Browne, education director of the Stratingh Institute
Prof. Dr. S. Otto, Stratingh Institute
Prof. Dr. M.A. Loi, Zernike Institute
Prof. Dr. E. List-Kratochvil, Humboldt-Universität zu Berlin
Student member
Added: L. Boomsma (HR) and Dr. G.P.R. Schaeffer, as advisors

4. Research area

The research area covers all areas of (macro/supra)molecular materials, with an emphasis on their function. Organic and organic-inorganic hybrid materials have played a central role in technology from photoresists to semiconductors to nanotechnology. The Stratingh Institute has long been active in this field and will continue to stay on the

cutting edge as new scientific challenges emerge in photovoltaics, interfacial chemistry, additive manufacturing, molecular electronics, energy storage and conversion, computational materials, etc. The research should be grounded in molecular chemistry, preferably with a significant synthetic component, but can include any area of research that exploits the ability to tailor the properties of organic and organic-inorganic hybrid materials, for example, to control interactions with electrons at the quantum level, the absorption, emission and conversion of photons, the mechanical and interfacial properties, etc. Research need not be connected to an existing technology, but should have an eye towards plausible technological applications.

5. Embedding: institute (and base unit)

This position will be embedded in the Stratingh Institute for Chemistry, basic unit 'Chemistry of (Bio)organic Materials and Devices'.

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 medically 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 will be embedded in the Stratingh Institute for Chemistry, which has, over the years, built an extensive network of national and international collaborations. Research groups within the Stratingh Institute take part in national research consortia, e.g., the Gravitation Program Functional Molecular Systems (FMS), 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 Next-Generation Materials for Photovoltaics. The Stratingh Institute has a long tradition of cooperative projects with industry (AKZO-NOBEL, Shell, BASF, Symeres) 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 research on molecular materials chemistry will be in close collaboration with groups in the Zernike Institute for Advanced Materials. As in particular the preparation of molecular materials, both organic, inorganic and hybrid systems, is well developed in our institutes, this will lead to a well-defined position also nationally. Globally the position will join the strong increase in attention for the chemistry of materials due to the shift to sustainable production and energy conversion.

7. Expected contributions to research

The candidate is expected to build their own independent research group in the field of functional molecular materials and surfaces through the design, synthesis, and characterization of (macro/supra)molecular and hybrid materials, and establish a strong and internationally recognized center of expertise in this field. Cooperative research programs will be established within the Stratingh Institute and potentially other institutes at the University of Groningen (e.g. Zernike Institute for Advanced Materials) and with industry. In addition, through combining current expertise in synthetic, physical-organic, organic and hybrid materials and supramolecular chemistry with new research lines in emerging areas of materials chemistry, the candidate will strengthen materials-related research in the institute. Obtaining substantial extramural funding is key to achieving these goals.

8. Expected contributions to teaching

The candidate will teach 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. The candidate will supervise the PhD students in her/his research group.

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.