

Faculty of Mathematics and Natural Sciences (FMNS)

Johann Bernoulli Institute for Mathematics and Computer Science (JBI)

Profile Report

Discipline: Mathematics (Wiskunde)
Level: Tenure Track Assistant Professor
Fte: full time (1.0 fte)

1. Scientific discipline

This profile report concerns a Tenure Track Assistant Professor position in Mathematics, preferably within one of the core fields of Algebra, Analysis, Discrete Mathematics and Optimization, Geometry, Stochastics and their Applications.

2. Vacancy

This position is opened by the Board of the Faculty (EMK/gl/16/00236) and will be embedded in the Johann Bernoulli Institute for Mathematics and Computer Science. The research group (basic unit) will be chosen with respect to the expertise of the candidate. The position falls within the framework of 'Career Paths in Science 3' ('Bèta's in Banen 3'). Please see link for [criteria and conditions](#).

3. Selection Committee

Prof.dr. J.B.T.M. Roerdink	(scientific director of JBI, Chair)
Prof.dr. H.L. Trentelman	(deputy director Undergraduate School FMNS)
Prof.dr. A. van der Schaft	(group leader of Systems, Control and Applied Analysis)
Prof.dr. J. Top	(group leader of Algebra)
Prof.dr. G. Vegter	(group leader Dynamical Systems, Geometry & Mathematical Physics)
I. Chiscop	(student member)
Prof. dr. V. Rottschäfer	(ext. member, professor of Analysis and Dynamical Systems, University of Leiden)

HR advisor:

L.A. Boomsma, Human Resources Department

4. Research area

There is flexibility with respect to the specific research area in mathematics of the candidate, but we encourage particularly candidates with expertise in Algebra or Analysis. We are looking for a (future) leader in his or her research field. Candidates with a research profile associated to the Data Science and Systems Complexity theme of the Johann Bernoulli Institute are especially encouraged to apply.

An overarching theme for the department is the analysis, control and inference of dynamical systems. The systems can be autonomous, or open to interaction with other systems. The subject involves a variety of mathematical theories ranging from analysis, algebra, and geometry to probability and statistics. Statistical, stochastic and algebraic aspects of network dynamics can also play an important role herein. Dynamical Systems theory and Systems & Control theory is used throughout the natural and engineering sciences, from mathematical physics to the earth and life sciences, and from fluid dynamics to power networks. The research is expected to benefit from close collaborations with several institutes inside and outside our university.

5. Embedding: Institute and Basic Unit

The Johann Bernoulli Institute for Mathematics and Computer Science (JBI) is part of the Faculty of Mathematics and Natural Sciences (FMNS). The profile of the institute centres around modelling and computation with a focus on science and technology, keeping a balanced mix of fundamental and applied aspects. The JBI comprises five mathematics programmes and five computer science programmes.

The mathematics programmes are: “Algebra”, “Dynamical Systems, Geometry & Mathematical Physics”, “Statistics & Probability”, “Systems, Control & Applied Analysis” and “Computational Mechanics & Numerical Mathematics”. The candidate will be embedded in the appropriate basic unit. The constituting programmes participate in seven national research schools and most of the PhD students are enrolled in an educational programme and take part in other activities offered by these schools.

The JBI has a leading role in the recently established cross-disciplinary research theme on Data Science and Systems Complexity (DSSC) within the Faculty of Mathematics and Natural Sciences. This concerns a research cluster of 60+ researchers in a number of basic disciplines (mathematics, computer science, artificial intelligence, systems & control, engineering, astronomy) and various scientific application domains. The ambition is to understand and solve big data problems by exploiting the joint perspectives from both data science and complexity science.

6. Local and (inter)national position

The JBI has a strong position in national and international mathematics, as evidenced by participation in NWO and EU projects (e.g. HYCON2, Cosmic Web, CA15109), publications in renowned journals and conferences, memberships of editorial boards (e.g. *EJC*, *Indagationes Mathematicae*, *J Stat Phys*), boards of mathematical societies (e.g. IBS, Bernoulli) and program committees, conference chairing (e.g. MTNS 2014, IWSM 2017), etc. Mathematics research in Groningen is strongly represented in Nonlinear Dynamical Systems, in Mathematical Physics and in Systems & Control. At

the national level the fundamental mathematical fields participate in the research clusters “Discrete, Interactive and Algorithmic Mathematics, Algebra and Number Theory” (DIAMANT), “Geometry and Quantum Theory” (GQT), “Nonlinear Dynamics of Natural Systems” (NDNS+) and “Stochastics – Theoretical and Applied Research” (STAR) and in the national research school WONDER.

7. Expected contribution to research

The candidate is expected to carry out an internationally leading research programme in his/her field of expertise and set up his/her own research group. He/she is a strong scientist in his/her own field, as well as open to collaborations with other scientific areas. A strong involvement in the research theme Data Science and Systems Complexity is expected. The research should have a visibility on a worldwide level and lead to publications in top journals. The research is expected to strengthen the existing efforts within JBI. Supervision of PhD students and postdocs and obtaining substantial external funding is an important part of the research activities.

8. Expected contribution to teaching

The candidate is expected to contribute to the teaching programmes of the bachelor and master programmes of Mathematics and Applied Mathematics in the Undergraduate and Graduate Schools of Science of the FMNS. He/she will contribute both to teaching existing courses, and to the development of new courses in his/her own subdiscipline of Mathematics. This includes the supervision of bachelor and master theses. The candidate will also contribute to other relevant programmes of the Faculty. During the first 6 years of the appointment the tenure-track assistant professor will devote at most 30% of the total time to educational tasks. Once tenure has been obtained, these tasks amount to 40%.

9. Expected contribution to the organization

During the first five years, the assistant professor is free from substantial administrative tasks. However, it is expected that he/she will play a role in the general organisation of the research programme, such as supervising PhD students or postdocs, running a seminar series, and contribute to the organisational tasks of the research institute JBI, the (under)graduate school, and the Faculty.