

Requirements Profile

Professorship for Nonperturbative Particle Physics with Application in Astrophysics

Strategic positioning (profile)

This professorship is within the area of non-perturbative particle physics with applications in astrophysics. Such applications could be, e.g., neutron stars, dark matter, or quantum gravity. Methodologically, this should be performed using non-perturbative approaches, e.g. (lattice gauge theory) simulations or functional methods. With this the professorship is within the core competence of particle physics at the University of Graz. This will maintain the worldwide unique profile of particle physics at Graz, an expertise in combining a broad range of non-perturbative methods. This will also be of relevance of the core area 'Computational Physics' at the GCP.

The subject completes the strategic developments of the portfolio at the University of Graz. This development already showed first successes as the acquisition of the FWF research group "strongly interacting dark matter" with multiple institutions. It complements the existing professorships and at the same time offers multiple collaborations in the tradition of the field at the University of Graz.

This professorship will allow further national cooperation with groups at different institutions. Especially activities at ÖAW SMI on strongly interacting matter, University of Innsbruck with observational astroparticle physics and simulations in astroparticle physics, ÖAW HEPHY in particle physics and dark matter, the universities in Vienna on particle physics, dark matter, and (quantum)gravity, need to be mentioned here. Also a possible involvement of Austria in gravitational wave observations can be exploited with this professorship. Scientifically, this ensures that the University of Graz can participate in all current national and international activities. This position will also be relevant with hindsight to Austria's participation in CERN, ESO, and ESA.

Strategically, it also ensures that the University of Graz, and in future the GCP, will remain the largest single institution unit for theoretical particle physics in Austria. It will therefore keep a sufficient critical size to head large-scale proposals. Also, this position will be needed to guarantee the full breadth in the education in theoretical physics in future. The position is also essential to continue the Doctoral Academy Consortium "Theoretical Particle Physics", which offers a structured PhD education and in which already more than 50 PhD positions have been acquired from third-party funds.

Employment requirements

- Austrian or equivalent foreign higher education degree corresponding with the position (doctorate/PhD)
- Habilitation or equivalent qualification in Theoretical Physics
- Outstanding academic qualifications in research and teaching in the relevant discipline and for the profile of the professorship (commensurate with stage of academic career)
- Success in attracting subject-specific project grants, particularly where competitively awarded third-party funds are concerned
- Skills in higher education didactics and online teaching
- Skills in the supervision and guidance of early career researchers
- Professional experience abroad during academic career
- Management and leadership experience
- Gender mainstreaming skills
- Good knowledge of English and, after a period of at most three years, teaching in German
- Excellent research record in non-perturbative particle physics and documented expertise in application to astrophysics
- International experience after completion of the Master's degree (desirable)

We plan to conduct a Teaching Skills Assessment including a lecture as part of the applicant's presentations. We also require from every candidate within the application process a teaching philosophy statement, list of taught courses, and, if available a teaching portfolio, certificates of didactics training and evaluation reports.

Expected qualifications profile (portfolio)

	Criterion	Objective
Research	Research profile	<i>Ability to establish/further develop an independent field of research</i>
	Publications	<i>Description of publication performance, in particular preferred subject-specific publication forms; listing of the five most important publications</i>
	Third-party funds	<i>Success in attracting research project grants and third party funding, in particular those that are awarded competitively (e.g. Austrian Science Fund (FWF)/EU/Austrian Research Promotion Agency (FFG) etc.)</i>
Teaching	Knowledge transfer	<i>Experience in teaching courses at the bachelor's/master's levels (teacher training programme)/doctorate Proficiency in the use of different languages or willingness to acquire different languages, especially German.</i>
	Theses	<i>Skills/experience with the (co)supervision of theses at the bachelor's/master's (diploma)/doctorate levels.</i>
	Higher education didactics	<i>Skills in higher education didactics.</i>
Lead ershi	Promotion of junior researchers	<i>Experience in the supervision/instruction of young researchers</i>

Requirements Profile **Professorship pursuant to Section 98 of the Universities Act (UG)**

	Leadership	Employee leadership skills or experience (Institute or projects)
	Gender Mainstreaming	Activity in relevant committees/roles or relevant training or continuing education
Additional criteria	Academic networking	Experience in national/international networking within the specialist community (e.g. committees, expert panels, function with journals)
	Professional experience abroad	Relatively long occupation at a university or research institute outside of the homeland during the academic career and/or experience in international networking during the academic career

Job description and role responsibilities

	Criterion	Operationalisation
Research	Research	Establishment and development of the field Theoretical Particle physics with non-perturbative methods and astrophysical applications.
	Publications	Publication performance corresponding to the level of the branch of science (upper quartile), but at least the same as hitherto
	Third-party funds	2 EU/FWF project proposals from the research group in 3 years, participation in joint applications of the Doctoral Academy Consortium "Theoretical Particle Physics"
	Open Access (optional)¹	Open access publications ("green" and "gold" open access, especially arxiv.org and SCOAP3 journals)
Teaching	Courses	Further development of the subject particle physics; As a general rule, 8 semester hours/semester courses at the bachelor's/master's (diploma, teacher training)/doctorate levels in the field(s) of study in theoretical physics.
	Theses	Proportionate supervision of theses in theoretical particle physics and/or astrophysics at the Institute of physics at master's at master's and doctorate level.
	Teaching (optional)	Willingness to use new media.
	Promotion of junior researchers	Supervision and instruction of young researchers up to postdoc level and participation in structured doctoral training, in particular through the doctoral academy consortium "Theoretical Particle Physics".
	Higher education didactics	If the post holder has no relevant qualification, teaching portfolio or teaching project, otherwise further training in higher education didactics is expected
Additional criteria	Reputation	A contribution to increasing international visibility in research and teaching (e.g. projects, guest professorships, talks at international visible conferences)
	Leadership	Assumption of leadership responsibilities, Participation in academic self-administration and Participation in UNISTART leadership training

¹ The University of Graz advocates publications in open access journals. These should therefore also be appropriately described during the appointment procedure.

Requirements Profile **Professorship pursuant to Section 98 of the Universities Act (UG)**

		<i>Participation in the development and establishing of the Graz Center of Physics</i>
	Gender mainstreaming	<i>Contribution to the implementation of the University of Graz equal opportunities strategy or Measures to promote junior female researchers or Participation in improving equality of opportunities</i>
	Transfer	<i>Contributions to increase public awareness (e.g. public outreach lectures (e.g. within the framework of the Academy of Monday or the seventh faculty), presentations within the framework of the Long Night of Research, science in pubs or cinemas, etc)</i>