

Masaryk University	
Faculty	Faculty of Science
Procedure field	Theoretical Physics and Astrophysics
Applicant	doc. Mgr. Norbert Werner, Ph.D.
Applicant's home unit, institution	Faculty of Science, Masaryk University
Board members	
Chair	prof. Rikard von Unge, Ph.D. <i>Faculty of Science, Masaryk University</i>
Members	prof. Mgr. Jiří Krtička, Ph.D. <i>Faculty of Science, Masaryk University</i> prof. RNDr. Vladimír Karas, DrSc. <i>Astronomical Institute of the Czech Academy of Sciences</i> prof. RNDr. Zdeněk Stuchlík, CSc. <i>Silesian University, Institute of Physics in Opava</i> Prof. Dr. Marcus Brüggen <i>University of Hamburg, Germany</i>

Evaluation of the applicant's scholarly/artistic qualifications

The scientific work of Norbert Werner is in the area of observational High Energy Astrophysics. It is focused on the hottest objects and the most energetic phenomena in the Universe.

Letters of support were written by Brian R. McNamara, Professor & University Research Chair (University of Waterloo), and Steven W. Allen, Professor of Physics (Stanford University and SLAC).

Norbert received his PhD from Utrecht University in 2008. He then moved to Stanford University, initially as a NASA Einstein Fellow, but he remained there for eight years as a scientific staff member. He held research positions at the Hungarian Academy of Sciences at Eötvös Loránd University and the Japanese Aerospace Exploration Agency as well as an Associated Professorship at Hiroshima University.

The research of Norbert Werner uses mainly space observatories and especially X-ray satellites, but also ground-based and airborne telescopes. Highlights from his early work include: the first detection of the warm-hot intergalactic medium in emission, in the region between two colliding galaxy clusters; the first detections of carbon, nitrogen and chromium features in the X-ray spectra of galaxy clusters, providing new constraints on the enrichment of the intergalactic medium; pioneering constraints on turbulence in giant elliptical galaxies from measurements of resonant line absorption; spectacular thermodynamic mapping of M87, the dominant galaxy at heart of the nearby Virgo Cluster, showing that ongoing Active Galactic Nuclei (AGN) feedback in this system is able to efficiently strip the galaxy of its most metal-rich, lowest entropy gas; the discovery of remarkable self-similarity in the thermodynamic profiles of the most dynamically relaxed ellipticals, pointing toward an exceptionally tight cooling/AGN feedback cycle; and showing, in contrast to conventional wisdom, that cold, molecular gas is common in nearby, giant ellipticals.

Norbert was also a key member of the research team that directed the unique abilities of the Suzaku satellite to study the outskirts of galaxy clusters. His 2013 paper (Werner et al., *Nature*, 502, 656) using Key Project observations of the Perseus Cluster revealed a strikingly uniform metal distribution in the cluster gas at large radii. This remarkable result requires that the enrichment of intergalactic gas must occur predominantly at very early times before clusters formed, and in turn carries significant implications for the history of star formation and AGN feedback, and the nature of the so-called warm-hot intergalactic medium.

Norbert was a key member of the Hitomi Science Team, helping to plan how best to use this novel satellite to constrain galaxy and cluster astrophysics.

More recently Norbert has initiated a new project that appears to hold enormous potential, namely the "Cubesats Applied for MEasuring and LOCALising Transients" (CAMELOT). This ambitious project, led by Norbert but with a team of international collaborators, proposes a fleet of nanosatellites equipped with large, scintillator-based soft gamma-ray detectors, to perform all-sky monitoring for gamma-ray burst sources. This simple, clever idea holds the potential to revolutionize gamma ray monitoring capabilities at relatively modest cost, and has sparked significant interest as agencies consider how best to complement their investments in ground- and space-based gravitational wave facilities, in the new era of multi-messenger astronomy. Excitingly, earlier this year Norbert's team was able to launch a pathfinder project, GRBAlpha (a 1U CubeSat nanosatellite), to demonstrate many aspects of the detector technology and electronics. This represents a major step toward the full realization of the project.

Norbert has consistently been able to win time on major astronomical observing facilities, including Chandra, XMM-Newton, Suzaku, Herschel, SOFIA, the Jansky Very Large Array, and the Very Large Telescope.

He has been successful in attracting funding to his research. In 2016 he won a prestigious Lendület II grant from the Hungarian Academy of Sciences. In 2020 he was awarded the prestigious MASH grant from Masaryk University as well as an EXPRO grant from the Czech Grant Agency as the Principal Investigator.

Norbert Werner has published more than 140 articles in scientific journals. These articles have been cited more than 4000 times (without self-citations) in WoS and his H-index is 43. His collaborations include several renowned institutions from the USA over Europe to Japan. He is regularly invited to give talks at the main conferences in his field.

Conclusion: The applicant's scholarly/artistic capabilities **meet** the requirements expected of applicants participating in a professor appointment procedure in the field of Theoretical Physics and Astrophysics.

Evaluation of the applicant's pedagogical experience

Norbert Werner has experience teaching at all levels of the university. He has developed and been teaching courses on the Bachelor, Master, and Doctoral level at universities in Hungary, Japan, and Holland as well as at Masaryk University. He has successfully supervised 5 Bachelor students, 5 Master students (+5 as a co-supervisor), and 1 (+5 as a co-supervisor) Doctoral student. He has co-authored a textbook and several published pedagogical texts.

Norbert Werner is furthermore an avid popularizer of Physics and Astronomy. He has given public lectures on various avenues such as TEDx in Bratislava or at the Burning Man festival in Black Rock USA. Recently he has started a Vidcast „Rozhovory o vesmíru“.

Conclusion: The applicant's pedagogical capabilities **meet** the requirements expected of applicants participating in a professor appointment procedure in the field of Theoretical Physics and Astrophysics.

Evaluation of the applicant as a respected and recognized scholarly or artistic figure in a given field

Norbert Werner belongs to the top scientist of his field. More than 95% of his publications are published in Q1 journals and the numbers are equally impressive when looking at the actual citations; at least 20% of his publications are among the 10% most cited articles in his field. He is regularly invited to the main conferences in the community to give talks.

He is regularly asked to comment on science in the media (newspapers/radio/tv) in the Czech Republic, Slovakia, and Hungary, and recently a NASA press release, mentioning his previous work, gave rise to interviews in the New York Times, CNN, BBC, and other world media.

In 2020 Norbert Werner was awarded the very prestigious Ignaz Lieben Prize by the Austrian Academy of Sciences to outstanding young scientists working in the fields of molecular biology, chemistry, or physics.

It is clear that Norbert Werner is an exceptional scientist, well established in the community, and respected by his peers.

Conclusion: The applicant **is** a respected and recognized scholarly figure in his/her field. The applicant **has** made a significant contribution to the development of his/her field. The applicant **constitutes** a leading figure in his/her field of scholarship or research.

Secret vote results

Voting took place: electronically

Number of board members		5
Number of votes cast		5
of which	in favour	5
	against	0

Board decision

Based on the outcome of the secret vote and following an evaluation of the applicant's scholarly or artistic qualifications, pedagogical experience and role as a respected and recognized scholarly or artistic figure, the board hereby submits a proposal to the Scientific Board of the Faculty of Science of Masaryk University to **appoint the applicant professor** of Theoretical Physics and Astrophysics.

In Brno on 14.10.2021

prof. Rikard von Unge, Ph.D.