

# NORDITA

NORDISK INSTITUT FOR TEORETISK ATOMFYSIK  
Danmark · Finland · Island · Norge · Sverige

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## COPY

Mr. Sighvatur Björgvinsson  
Chairman of the Finance Committee  
Parliament of Iceland - Althing  
Reykjavik  
Iceland

Dear Mr. Björgvinsson,

I am writing in connection with the possibility of making a permanent appointment in astrophysics in Iceland. I write as a private person who has followed developments in Iceland over a period of some years, and my remarks are not to be regarded as a statement of Nordita's position. My comments are offered in the spirit of providing some background information which you may find helpful in making decisions on future developments in Iceland.

The past forty years have seen the opening of a large number of new windows on the Universe. Whereas astronomy was formerly based almost exclusively on visible light, observations can now be made in many different bands of the spectrum, ranging from  $\gamma$ -rays and X-rays, to ultraviolet light, to infrared radiation, to microwaves and radiowaves. This development has been driven in large measure by technological advances, especially in electronics and in the use of artificial satellites. The latter makes it possible to observe in wavelength bands where, because of the earth's atmosphere, radiation cannot penetrate to the earth's surface.

These new windows have led to many discoveries of qualitatively new phenomena. For example, advances in microwave technology led to the discovery of the radiation remaining from the earliest seconds of the Universe. This led to cosmology becoming an observational science, rather than a largely theoretical one. As another example, one may mention neutron stars, which were first observed using radio waves and X-rays more than 30 years after they had been predicted to exist on theoretical grounds.

Attempts to understand the newly discovered phenomena has been a great stimulus not only to astronomy, but also to physics. The new phenomena occur under conditions very different from those in the laboratory, and therefore challenge ones theoretical understanding. In addition, to understand most of them one requires knowledge from more than a single subfield of physics, and as a result astrophysics has been a powerful stimulus to cross-disciplinary studies. For example, aspects of nuclear physics, condensed matter physics, elementary particle physics and general relativity are required in studies of neutron stars, and an equally extensive range of disciplines is

required in cosmology.

The Nordic countries have participated in the above development in a number of different ways. Many of the countries are involved in collaborations on modern optical telescopes such as the Nordic Optical Telescope and other major international projects. There are also a number of groups active in X-ray and other space-based astronomy, and in radioastronomy. On the theoretical side there are extensive contacts between Nordic astrophysicists. In addition, the level of activity in the field is increasing, as is indicated by, for example, the creation of chairs in the subject in Sweden, and the appointment of an astrophysicist as professor at Nordita.

To summarize, astrophysics is a central discipline in modern science. Knowledge and understanding in this area have increased dramatically in recent years, and there is every reason to expect this will continue. The subject is of great importance not only because of the challenge of understanding the cosmos, but also because of its impact on other branches of physics. For these reasons, and because of the intellectual excitement of the subject, it would be very natural if a permanent position in astrophysics were created in Iceland. There are in Iceland a number of people working in astrophysics, and the good contacts these people enjoy with other groups within the Nordic countries and elsewhere imply that the subject could thrive in Iceland.

Yours sincerely,

*C. J. Pethick*

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