

Evaluation report

Evaluated point	Grade	Comments
Scientific impact of research	Very good	<p>Tartu Observatory is the only Estonian institution that is devoted to space research and astronomy. As such, it plays an essential role as taking part in international research in this area, in particular as a member of the European Space Agency (ESA). Highlights include galaxy physics and cosmology, with participation in scientific programs around the Gaia satellite. The first Estonian satellite EST cube was built in the observatory, which has competence for high level instrumentation and space technology. Other highlights concern remote sensing, in relation with climate change, atmospheric physics, water resources and landcover. The research activity at the observatory is impressive. There is great evidence of strategic thinking and the observatory has developed well on all fronts - staffing, infrastructure and research environment. The research environment looks attractive and welcoming. The research groups are internationally visible and networked. The involvement with ESA is a major boost for the observatory and highly significant for Estonia. There is a sense of pride in promoting individuals in both research and research-supportive activities, with success stories including science awards, and distinguished recognition for outreach activity. The observatory has been successful in attracting research funding from diverse sources. It is a positive development that the observatory has increased the share of funding from international programmes, including H2020, Interreg and ESA contracts. The observatory is on a growth trajectory in research output, increasing number of articles per researcher and completion of co-supervised PhDs. The output covers the whole range from theoretical to applied research.</p>
Sustainability and potential of research	Very good	<p>Tartu observatory is excellently positioned for future leadership in its field. The research directions covered are of strategic importance to Estonia. The observatory recognizes the importance of rejuvenation of its staff, and has been successful in attracting early career researchers back to Estonia after times abroad. It has also grown its doctoral training activity. It is notable that staff have been proactive in engaging with teaching to reach out to students at all levels. The observatory has done well in a changing funding environment and is also developing new potential income routes by establishing test laboratories that can provide services to companies. Research potential has been enhanced by new buildings and infrastructure. The observatory is remarkably well managed, both administratively and scientifically. Its research activity, which is part of the international activity in the space area, is planned in the long term and should even increase with a larger involvement in ESA. Development plans are well established and prove the sustainability and potential</p>

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		of research. Annual reports are produced which testify to the excellence of the activity.
Societal importance of research	Very good	Tartu observatory's work is of great societal relevance. For example, research in space technology opens up new opportunities for Estonian companies and work in remote sensing contributes directly to monitoring of the environment. The observatory is highly visible in society and plays a major role in popularising science through its outreach activities and visitor programme. The observatory has both an international mission and a local one, with participation in national programmes and discussions, and with international, national and local collaboration. The observatory has developed a number of applications for small or medium-sized companies, for which its experts can advise, as well as state agencies. The observatory has a long-term tradition of science popularization. It takes part in teaching at Tartu University.
<p>Scientific basis in the field is sufficient to conduct doctoral studies. (This question should be answered only if: a) institution being evaluated is conducting doctoral studies and; b) The field being evaluated is proposed to grant positive evaluation. If these conditions are met then: a) If the level of scientific basis is sufficient for conducting doctoral studies in every structural unit being evaluated, then the answer should be „yes“; b) If the scientific basis is not sufficient in some structural units, then those units should be listed.)</p>		<p>Yes. Students have the chance to be trained in excellent conditions, in a vivid scientific environment. This attracts international PhD students.</p>

Summary assessment

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<p>Areas of special note as appropriate (Where necessary indicate sub-fields, assessment criteria, and/or structural units which, in the committee's opinion, were of a notably high level.)</p>		<p>The TO provides a very good environment for scientific research and the training of PhD students, and there is a good relationship with the Estonian University of Life Sciences and Tartu University. Staff are dedicated and enthusiastic about their research, and there is an impressive output of ancillary publications and educational material besides journal articles. The contribution of the TO to public understanding of science is significant.</p>
<p>Areas in need of improvement as appropriate (Where necessary indicate sub-fields of the field being evaluated, assessment criteria, and/or structural units which, in the committee's opinion, revealed significant shortcomings.)</p>		<p>Published output is moderate averaging around 1 paper/year /staff member. This could be an area of improvement encouraged by recruitment of PhD students and focussing of new staff into areas of existing strengths, and encouragement of new collaborations.</p>
<p>Assessment proposal to the Minister of Education and Research</p>	<p>To grant positive evaluation</p>	<p>An impressive well-run organization carrying out high level research of fundamental and practical significance.</p>

Feedback

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<p>Feedback for institution (This question should be answered only if the institution asked for feedback from the evaluation committee in the self-report (about up to three specific areas of R&D which it finds to be currently important, e.g., related to its development plan).)</p>	<p>The question concerns the problems that could arise when joining Tartu University in terms of teaching obligations. It is clear that any university needs rules in order to distribute teaching loads. These may take into account the research excellence. In this case Tartu Observatory is well placed to benefit from this. The discussion is not easy because it has to be done on a collective basis, and also to take care of the specificities of each individual. In order to preserve the research potential of the observatory, it is important that young researchers be the first to be protected from a teaching load that would be too heavy. In many universities of Europe, research-active junior staff have no teaching at all or a small load of teaching.</p>
<p>Suggestions for unit, institution, state etc (As appropriate, committee can give additional feedback for the structural unit, the institution, or the State (please specify whom feedback is directed to) according to the directive assessment criteria for regular evaluation (article 7)).</p>	<p>The observatory is in advanced discussions about integration with Tartu University. It is commendable that the leadership and staff engage proactively and positively with this change. The observatory appears very well set up to extend its operation to teaching aligned with its research remit. Over time it is very likely that the integration of TO into Tartu University will turn out to be a win-win situation.</p>