Guidelines for projects

Astronomy for Development

Eli Grant, Kevin Govender, Vanessa McBride & Ramasamy Venugopal

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For the most recent version, please go to

www.astro4dev.org/getting-started

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1. What is astronomy for development?

The International Astronomical Union (IAU) adopted a strategic plan in 2010 that gave fresh perspective and visible commitment to public engagement and astronomy for development. The Office of Astronomy for Development (OAD) was established in 2011 with the mandate of executing this vision and exploring how astronomy, including its practitioners, skills and infrastructure, might contribute to driving development and improving the conditions for humanity across the globe.

1.A The United Nations sustainable development goals

At the OAD, our development goals are framed by the United Nations Sustainable Development Goals (SDGs), which are a set of globally adopted priorities to end poverty, preserve the planet and promote peace and prosperity for all. Our mission is to encourage the astronomy community to work towards these goals through the (astronomy-based) interventions that they execute as IAU-OAD funded projects. It can be difficult to conceptualise how astronomy, an esoteric and specialised science, can contribute to the very immediate and real challenges facing society today. However, below are some of the ways in which past projects have tried to influence the SDGs.

The majority of the OAD funded projects have focused on capacity building in education by conducting workshops, schools, training etc., targeting especially those communities and regions which are disadvantaged or under-represented. These actions directly impact on **SDG #4 Quality Education** and **SDG #10 Reduced Inequalities**. Projects have also used astronomy at school and university level to teach skills in programming, data science, mathematics etc. Examples: Astronomy for Literacy, Madagascar Astronomy Python Workshop, Astrolab, Big Data in Astronomy for Social Innovation, Astronomy for Visually Impaired.

Light pollution is not just a challenge for astronomy but also affects humans and ecosystems. The Dark Skies Rangers program raised awareness of the impact of light pollution and energy efficient lighting (which relates to **SDG #7 Affordable and Clean Energy**). Example: Dark Skies Outreach to sub-saharan Africa.

Some projects have included a focus on **SDG #5 Gender Equality**. Bridging the gender divide is especially important in STEM fields and astronomy has been used as catalyst in this process. Example, Girls Astronomy Camp in Nigeria.

Community programs run by an astronomy observatory have encouraged sustainable use of resources such as water and energy. In this case astronomy aims to contribute in some way to **SDG #6 Clean Water and Sanitation** and **SDG #11 Sustainable Cities and Communities**. Example: Community Development around Timor Observatory in Indonesia.

Astro-tourism has gained traction in recent years: the idea that astronomical sites (historical & heritage sites, observatories, dark sky reserves etc.) can be systematically promoted as points of interest and work together with the tourism industry to contribute to the local economy. This relates to **SDG #8 Decent Work and Economic Growth** and **SDG #9 Industry, Innovation and Infrastructure** Examples, Development of Astro Tourism in South West Asia, Astronomy for Himalayan Livelihood Creation

Astronomy has been used in various contexts to bring people together. Taking it a step further, Astronomy as a tool for diplomacy brings together communities separated by conflict. Example: Columba Hypatia: Astronomy for Peace relates to **SDG #16 Peace, Justice and Strong Institutions**

A large number of indicators have been defined by the UN in order to measure progress on the Sustainable Development Goals between now and 2030. Some datasets and APIs (Application Programming Interfaces) which may be useful for tracking these indicators are available here.

For the 2019 call, the OAD is introducing Flagship themes. From the experience of funding 140 projects (and reviewing about 1000 proposals) since 2013, and with input from 10 regional offices around the world, the OAD has identified Flagship (or Signature) projects that encapsulate the idea of astronomy for development, and which have the potential for global roll-out. Flagships are seen as an effective means for achieving significant impact of astronomy for development over a substantial part of the world.

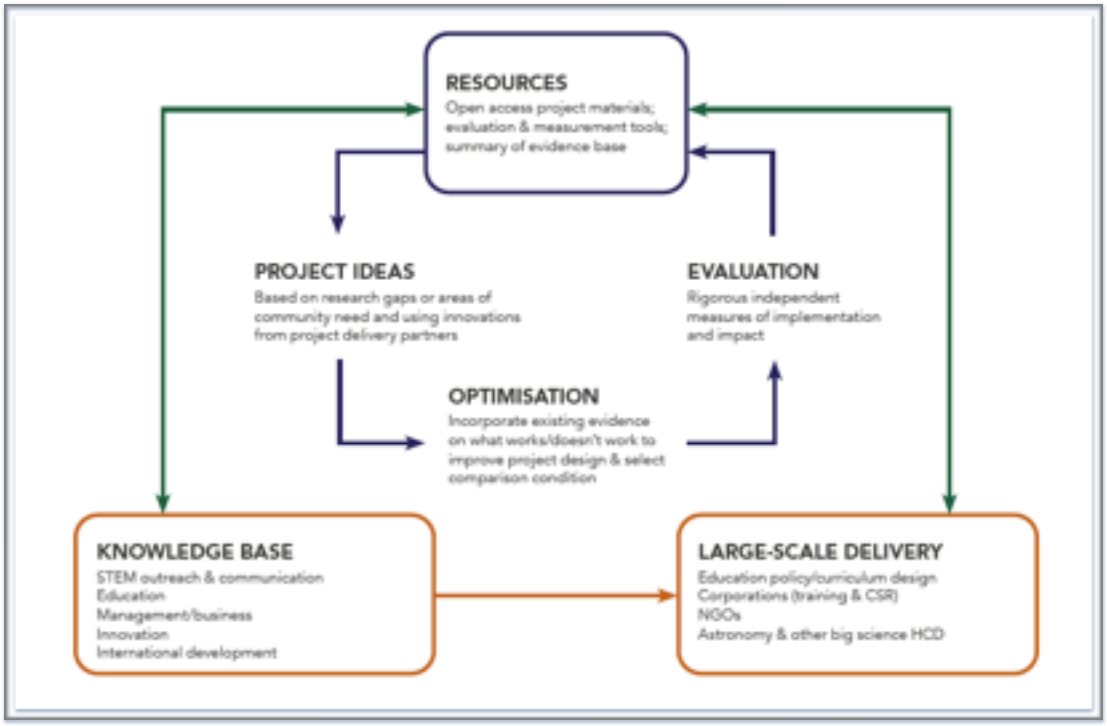
Two Flagship themes for this call are:

1. **Sustainable, local socio-economic development through Astronomy**
2. **Science diplomacy through Astronomy: Celebrating our Common Humanity**

1.B Will my project have an impact?

Our philosophy is to build developmental interventions on what is known to work, improve those projects over time, and to avoid interventions that have unintended negative consequences. A simple illustration of how we see this working is shown below — referred to as the OAD impact cycle. The cycle is like a 'map' through which projects can:

1. access OAD resources and available scientific evidence on effective science communication, education and international development strategies
2. use these resources to develop scientifically-informed project designs
3. ensure they are not replicating past projects
4. draw from past projects' lessons when it comes to planning and designing their projects, thus avoiding the repetition of mistakes
5. monitor their project's implementation, providing a foundation to attract funding, increase the project's scale and enable other projects to replicate their success
6. evaluate their project's impact, thus contributing to a growing scientific evidence base on what works and providing evidence of how astronomy can most effectively contribute to development



The impact cycle begins with a project idea, which we turn into a project design through optimisation. During and after the project execution, evaluation helps us understand the impact and adds to the evidence base for future projects. See these pages for more on understanding impact and the OAD impact cycle.
www.astro4dev.org/?p=16114
www.astro4dev.org/funded-projects/impact-cycle/

2. I have an idea for a project. What should I know first?

Below are a few steps that might be useful once you've come up with a concept for running a project:

2.A Has someone already done this?

Search our database of past projects to see if you've been scooped! You may search through the list of previously funded projects by name, task force, location, keywords etc.

Your project can build upon what has been done before – browse resources from previous OAD projects.

2.B How do I define the problem?

What problem is your project planning to address?
Given the risks of unintended consequences (see the page on Monitoring & Evaluation: www.astro4dev.org/monitoring-evaluation/), if there is no problem it is probably most helpful not to interfere. The nature of the problem should be clearly defined and its existence confirmed through grassroots knowledge and empirical research. For example, it is unsafe to assume that students in all contexts lack motivation or interest in science. In some places, lack of motivation or interest may reduce science participation rates; in other places, however, students may be extremely keen but unable to continue science participation for other reasons (e.g. lack of financial resources, transportation etc.).

2.C Is the intervention needed?

It's worth considering whether our target audience will be accepting of the intervention — we don't want to be imposing our ideas in a place where they are unwelcome — and whether we can make a feasible contribution to solving the problem with the resources available. For help addressing these points see our pages on Needs Analysis and Monitoring and Evaluation, or get in touch with the OAD, or one of its Regional Offices of Astronomy for Development or Language Expertise Centres.

2.D Is there a Regional Office of Astronomy for Development that can help?

Search our Regional Offices of Astronomy for Development and Language Expertise Centres to find the countries/languages they serve and their contact details.

2.E Will it work?

Check the OAD's knowledge base — a repository of information on what has and hasn't worked for previous astro4dev projects, as well as a literature based library of evidence for STEM education, outreach and development projects. It's important to think of this before starting the project, so we can plan measures that will tell us if our projects have succeeded or not.

2.F Who are my possible development partners?

In order to maximise our impact, and make best use of available evidence, the OAD encourages interdisciplinary partnerships. These partnerships push us to think outside our comfort zone, i.e. where the magic happens! Partners could come from within your institution, e.g. with the social science, economics or physics education specialists, or from outside of your institution, e.g. Non-Governmental

Organizations or monitoring and evaluation specialists. During Stage 2, proposers will have the opportunity to interact with these development partners, the OAD, and any of the Regional and Language Offices of the Astronomy for Development that may contribute to the design of their project.

2.G More on project design

Follow this link for more details on impact-oriented project design.

3. How do I test whether it is working or not?

3.A Background on monitoring and evaluation

Astronomy for development is concerned with activities that involve people rather than stars. That is to say, Astro4Dev projects are projects that seek to affect human development, not achieve scientific objectives. Astro4Dev projects are thus classed as "**social interventions**": interventions, policies, practices or programmes that seek to improve social welfare outcomes by addressing social, economic, health, psychology, education or behaviour problems, etc.

Research has shown that interventions often run into unexpected barriers and can produce unexpected negative, as well as positive, impacts. As a result, non-profit organisations and other intervention providers have come under increasing pressure from funders and other stakeholders to provide information about their performance. Monitoring and evaluation refer to a combination of activities and procedures used to effectively measure, report and learn from project performance.

There are two main types of evaluation, focused on different questions listed in the definition above: **Impact evaluation**(summative) and **Process evaluation** (formative). For more details see our Monitoring & Evaluation page.

3.B ABCs of surveys

Questionnaires and assessments are essential for both the Impact and Process evaluations mentioned above. For guidance on setting up both surveys and educational assessments (i.e. to measure learning outcomes) see our Survey & Assessment page.

4. How do I report back to the OAD?

Projects funded by the OAD are required to submit regular reports of progress as well as a final report of the project. Our reporting guidelines can be found at this link. The OAD is continuing to develop these to make reporting easier for project implementers and more useful for future project proposers.

Additional Information:

Qualitative Research Methods Toolkit

Qualitative research methods seek to answer questions such as the why and how of human behaviour, opinion, and experience. The basis of qualitative research lies in the interpretive approach to social inquiry and in the lived experience of human beings. Approaches to social inquiry consist of sampling procedures, data collection and analysis tools and world views of the researchers. More information at http://www.astro4dev.org/qualitative-research-methods-toolkit/.

Theory of Change commonly abbreviated to TOC, is essentially a comprehensive description of how and why a desired change is expected to happen in a particular context/project. A key defining feature of a theory of change is the presentation of the link between outcomes and activities to explain HOW and WHY the desired change is expected to come about.

Logic Model is "a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your programme, the activities you plan to do and the changes/results you hope to achieve".

An **online course** is now available on Astronomy for Development designed to provide a helping hand to anyone who intends to submit an application to the OAD Call for Proposals.

Contact: projects@astro4dev.org