

Recommendations for (inter)national organizations

GOAL

Culture shift whereby Informal Physics Education (IPE) is widely recognized as an essential physics practice

LEVER 1

Structures

Amplify structures that frame IPE as an essential activity worthy of resource allocation.



LEVER 2

Engagement of interested, influential, and impacted parties

Identify techniques for recruiting and empowering people to engage in and/or support IPE as essential physics practice.



LEVER 3

Integrating Research-Based Practices in IPE

Leverage research to understand, develop, and advocate for IPE as essential physics practice.





LEVER 1 - Structures

Amplify structures that frame IPE as an essential activity worthy of resource allocation.

- **S.17 (*same as R.20): Academic and commercial publishers should establish common publication venues for IPE work** — Existing venues such as *Physical Review PER* [71], the *Journal of STEM Outreach* [72], *Citizen Science: Theory & Practice* [73], *The Physics Teacher* [74], and *Connected Science Learning* [75] should better connect with the IPE community to make them aware of their publication options. Journals should also establish multiple submission types to allow for both research and programmatic articles rooted in experience, practice, and evaluation. Whenever possible, these publication venues should also be made open access.
- **S.7 (*same as R.14): Establish recognition mechanisms for exemplary IPE programs and practitioners, including students** — Such recognition could include site or practitioner awards, digital badges or professional certificates for completing IPE training, and features in institutional communications. Recognition can be implemented at the department, community of practice (e.g., JNIPER) or international organization (e.g., APS) scale.
- **S.18 (*same as R.22): Create dedicated IPE sessions at physics conferences and schedule them in prime slots** — Science societies that run physics conferences can include IPE in their abstract sorting categories, consider IPE practitioners for plenaries, and more.
- **S.19: Funding agencies should support IPE through the following mechanisms** — Require all grants to include a public engagement plan, and providing detailed guidance on evidence-based best practices; Attend to public engagement action and implementation in annual grant reports and reviews, ensuring that quality IPE is valued and is not relegated to a “box-checking” exercise; Fund IPE programs directly; Fund studies of public engagement and science communication trainings to expand knowledge of effective training practices; Direct graduate fellowship awards to include funding for public engagement training and implementation. (This last example is aligned with the call from the Research!America Public Engagement Working Group [76] .) This recommendation overlaps with R.23.
- **S.20: Create federal structures that support national agencies in growing their participatory public engagement and science communication efforts**— See, for example, the August 2023 Letter from the Presidential Council of Advisors on Science and Technology [77].



LEVER 2 - Engagement of interested, influential, and impacted parties

Identify techniques for recruiting and empowering people to engage in and/or support IPE as essential physics practice.

- **P.11: Acknowledge the IPE career pathways that students can take and legitimize the rhetoric around those IPE careers** – Career panels and talks should include examples of physics majors who have gone on to a career in IPE, including the option to pursue the academic track with a research-focus on IPE. Job boards and career resources should also illustrate the many forms an IPE career can take.
- **P.20: Physics societies should release policy statements on the importance of IPE to physics** – This will promote buy-in from members, and also provides a pathway for the organization to engage in formal advocacy on the topic.

Successful Example: APS Statement on Public Engagement [67].



LEVER 3 - Integrating Research-Based Practices in Informal Physics Education

Leverage research to understand, develop, and advocate for IPE as essential physics practice.

- **R.20 (*same as S.17): Academic and commercial publishers should establish common publication venues for IPE work** – Existing venues such as *Physical Review PER* [71], *the Journal of STEM Outreach* [72], *Citizen Science: Theory & Practice* [73], *The Physics Teacher* [74], and *Connected Science Learning* [75] should better connect with the IPE community to make them aware of their publication options. Journals should also establish multiple submission types to allow for both research and programmatic articles rooted in experience, practice, and evaluation. Whenever possible, these publication venues should also be made open access.
- **R.21: Academic and commercial publishers should build infrastructure for collective data sharing** – In many cases, this is already, or soon will be, required by international and US-federal funding agencies. Publishers should require open data whenever possible, to facilitate the research community's ability to replicate and build upon prior studies.
- **R.22 (*same as S.18): Create dedicated IPE sessions at physics conferences and schedule them in prime slots** - Science societies that run physics conferences can include IPE in their abstract sorting categories, consider IPE practitioners for plenaries, and more.
- **R.23: Funding agencies should support IPE evaluation, assessment, and research** – There are at least two mechanisms for this support: (a) Provide grant lines for IPE research, as well as training for physicists in IPE research methods; (b) Require all grants to include a public engagement plan which incorporates evaluation. This evaluation should be a required component of the annual and summative grant reports, and funding withheld if evaluation is omitted. This recommendation overlaps with S.19.