

Conference on Non-Digital Game-Based Learning in Physics and STEM Disciplines

The Game Science Research Center: a cross-institutional community for non-digital game-based learning in STEM

R.Blanos^{1,6}, E.Carraro¹, F.Chiarello^{2,6}, M.D'Alessandro¹, F.Petrera¹, S.Ricciardi^{5,6}, A.Sidotti^{4,6}, A.Tognolli¹

¹National Institute of Oceanography and Applied Geophysics OGS

² National Research Council CNR

³National Institute for Nuclear Physics INFN

⁴National Institute for Nuclear Physics INFN

⁵National Institute of Astrophysics INAF

⁶Game Science Research Center GAME.SCI RE.CENTER

In recent years, games have emerged as powerful tools for promoting scientific culture in both formal education and public engagement contexts. Non-digital games, including board games, card games and role-playing games, provide opportunities to explore complex scientific concepts through participatory experiences that foster reasoning, discussion and collaboration.

In science education, games are not only used to motivate and engage participants, but also to help them understand how scientific research works, how evidence is built, and how scientific communities operate. Within this framework, the experience developed by the Game Science Research Center (GSRC) is based on a community of practice involving researchers, educators, science communicators and external game designers from several Italian research institutions, including National Institute of Oceanography and Applied Geophysics - OGS, National Research Council (CNR), National Institute for Nuclear Physics (INFN), and National Institute of Astrophysics (INAF).

Case studies such as On Board, The First 20 Minutes, PIXEL, and Photonics in Play illustrate how different game formats can become not only tools for science communication, but also educational and cultural spaces capable of connecting research, schools and society.