Beyond Einstein’s Anniversary

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In 2015, one hundred years after Einstein’s creation of the theory of general relativity, windows of opportunity are open for those of us in the scientific community and beyond who wish to communicate Einstein's vision for education, research, and applications. We marked the 100th anniversary of the year Einstein discovered general relativity with great fanfare. Celebrating the Einstein event, launched in anticipation of the centennial, told the story of Einstein to the world and shared the excitement of Einstein's theory. In organizing the anniversary, members of the physics and mathematics community worked with artists, musicians, composers, scientists, dancers, filmmakers, historians, architects, and educators on series of interconnected events designed to engage the general public (https://aas.org/posts/news/2015/10/message-einstein’s-centenary-2015). The following three topics have been selected from among many others that will keep the physics community thriving with follow-ups to the anniversary: (1) research to uncover the development of relativity, (2) practical implications of general relativity, and (3) world peace.

1. Historiographical Framework for Relativity

In essence the paper proposes a promising work schedule to explore the history of the theory of general relativity in distinctive phases of its development (i) after its discovery in 1915, (ii) as a physical theory until the mid 1950s, and (iii) a renaissance of it through its scientific potential and research community building. The authors propose a historiographical framework for investigations of the persistence and resilience of general relativity and provide a very comprehensive selection of literature that is available and easy accessible for this purpose. In this regard they collected in Table I of their paper (page 614) a number of research centres that became hubs of the relativity research community in the mid 1950s to the mid 1960s. The Table not only lists the respective Institutions but also the Leader(s) and Major Research Interests of them. We are taking the opportunity of this paper to refer to the literature of [2] to [5], that may not be so widely known to researchers, that offers information on the scientific potential and research community building as emphasized in (ii) above as organized by Hans-Juergen Treder (1928-2006) since the beginning of the 1960s in Berlin and Potsdam. Most of the Leaders in Table I have participated and contributed to the 1965 Einstein-Symposium [1,2], 1979 Einstein-Centenarium [3], and 1981 Michelson-Colloquium. The literature in [2] to [5] might be a rich source of information on the science and community building for general relativity. The year 2016 could be utilized to review this process by recalling the achievements of Hans-Juergen Treder (see Figure 1).
Figure 1. Hans-Juergen Treder (left) and John Stachel (right) during the 1979 Einstein-Centenarium at a meeting in Einstein’s summer house in Caputh, Potsdam.

In the past 25 years of UN/ESA/NASA/JAXA workshops on basic space science with the participation of scientists from 194 UN Member States, we always came to discuss the perception of Einstein in those countries. It might be of interest to make available information on research results and public perception of Einstein in all countries under very different society models?


2. Global Navigation Satellite Systems (GNSS) and Relativity

General relativity is needed to understand astrophysical realms and cosmology. But the special and general theory of relativity also turns out to be essential for the many practical activities that rely on the precision of GNSS.

In this regard we have in mind specifically the achievement of a number of member States of the UN under the umbrella of the UN: After UNISPACE III in 1999, all of a sudden a new seemingly important topic did show up in the UN’s Committee on the Peaceful Uses of Outer Space (COPUOS). It was called GNSS and was pursued independent from the standard topics like satellite remote sensing, satellite meteorology, satellite communications, and space and atmospheric science (not to mention space law). Pretty fast, GNSS operators (USA, Russia, Europe, China, Japan, India) agreed to establish the International Committee on Global Navigation Satellite Systems (ICG).
ICG simply agreed to coordinate activities of GNSS in outer space. UN COPUOS was established as the vehicle to achieve the goal of peaceful uses of outer space through UN deliberations. It was a great satisfaction to see these member States cooperating with great insights and willingness to utilize outer space for the benefit of all 194 Member States. It continues working fine until today. On the way since 1999 we had the idea which we did not yet discuss in public with GNSS operators: Einstein’s theory of relativity turned out to be essential for the innumerable activities that today rely on the precision of the GNSS. May be the operators would agree to support a kind of research establishment that does theory and experiment with GNSS for fundamental research?

How did the world respond to Einstein's letter? The November 1947 issue of the journal United Nations World published only one follow-up letter to the Editor. It suggested that moving toward a world government might be a good idea. The December 1947 and January 1948 issues of the same journal had no letters to the Editor on the subject of Einstein's letter. Outside the journal's traditional environment, people from different occupations debated the wisdom of Einstein's views indicating that he was on the right track.

2015, almost seventy years after the UN World magazine published Einstein's letter, an open letter titled “Autonomous Weapons: An Open Letter from AI & Robotics Researchers” was announced July 28 at the opening of the International Joint Conference on Artificial Intelligence (IJCAI) conference (http://futureoflife.org/open-letter-autonomous-weapons/). Collectively, scientific and technological luminaries have signed an open letter calling for the world's governments to ban the development of "offensive autonomous weapons" to prevent a “military AI arms race”. Essentially, the letter is concerned with dumb robots and vehicles being turned into smart autonomous weapons. A similar initiative to Einstein’s letter? To date (31 January 2016) 20806 individuals signed the letter!