**GLOBAL IMPACT HERITAGE ASSOCIATION: A PROJECT SERVING THE PUBLIC AND IMPACT RESEARCH.** P. Lambert1. 1CIRIR - Center for International Research and Restitution on Impacts and on Rochechouart, F-87600 Rochechouart, France, lambertbdx@gmail.com.

**Introduction:** The why, who and how associating the globally existing structures to promote impact geoheritage amongst the public are discussed in pre-amble to the project “Global Impact Heritage Association” (name subject to change), intended for the benefit of the public worldwide, with positive impact on ground based planetary research.

**Why:** Impact cratering is a still relatively young and newly recognized geo-process (~60 years), and its nature, effects, and role are not well known by the public at large. Yet impact cratering is now widely acknowledged by the scientific community as a fundamental planetary process that occurred, and still occurs, throughout the solar system. Meteorites as the remnants of planetary bodies are abundantly affected by impact processes, and the large planetary objects of the solar system were essentially formed as the result of impacts. Eventually, impact craters are the most observed geo-form on the surface of most planetary objects (including the Moon, Mercury, much of Mars, and many other rocky and frozen bodies). Over the last decades it has also become apparent that impact events have profoundly affected the origin and evolution of Earth. The European Space Agency identifies asteroid impact as a major threat to Earth and focuses its 2019 strategy for renewed funding on this threat. The cataclysmic role of meteorite impact on evolution of life is also widely recognized by the public. What has remained obscure, however, is the potentially fundamental “positive” role impact could have played regarding the development and evolution of life, both as a possible “carrier” of micro-organisms to seed Earth, and as a provider of environmental conditions favorable for the seeding with and/or the development of life on otherwise hostile planetary surfaces (including the early Earth). Recent space missions revealed that complex organic chemistry is active on a variety of planetary objects (including satellite Titan or comet Churyumov–Gerasimenko). Organic chemistry has become an active field of meteorite studies. It has been recently established that large impacts are capable of triggering hydrothermal activity on planetary surfaces without free water, a mechanism that may have resulted in transient giant lakes in large impact craters on Mars [1]. And finally, impacts can also produce economic ore deposits. Approximately one third of the meteorite impact structures confirmed on Earth have major or significant economic resources. On the Moon, the impact mechanism is responsible for all materials exposed on its surface, and plans for mining the Moon’s resources necessarily need to consider the impact cratering process. While essentially incomplete due to erosion, sedimentation, and plate tectonics, the terrestrial impact cratering record is and will remain for many decades the best opportunity offered to mankind in the whole Solar System to conduct field work and laboratory studies towards improved understanding of the impact cratering process. In this context the need for elevating the level of awareness of impact cratering, and interest by the public on this topic is obvious. The scientific community and the funding available for research in this field are still rather small and both needs to be developed. This situation can be improved through sensibilization of the general public and other stakeholders.

This is precisely the core objective of the already existing outreach initiatives and structures dedicated to meteorite impact cratering. Our proposal is, thus, to gather the global forces toward that aim, bringing the existing and future structures together into a “win-win” partnership (see “How”).

**Who:** This association would primarily focus on structures (private and public) directly in contact with the public, i.e. museums, natural reserves and parks, and geoparks. With nearly 300,000 visitors/year, Meteor Crater Museum, a private structure, is way ahead of all others in terms of visitors’ numbers. The accessibility, the quality of the Museum and the perfectly-sized and preserved crater combine to make this site such a success. Next in line are the Ries crater museum and the Ries geopark in Germany, where the total number of visitors to both these institutions is more difficult to figure out but is estimated at some 50,000/year. The Ries Crater Museum in Nördlingen is run by the state of Bavaria and the municipality. The Ries Geopark is a national institution that is run by the local district council. The next structures are about ten times smaller, with the Steinheim Meteor Crater Museum (Germany) that opened in 1978, run by the local communities, and the Paul Pellias Museum in Rochechouart dedicated to the Rochechouart impact structure. This facility is part of the “Réserve Nationale de l’Astrobîôme de Rochechouart-Chassenon” primarily intended to protect the impact geoheritage. CIRIR, the publically funded international association for developing both the research and the restitution to the public is currently settling on site. CIRIR involves more than 70 specialists of geoherit-
age and impact research, and aims to bring the Rochechouart impact structure onto the World Heritage list. CIRIR and CIRIR-UNESCO project will boost the interest of the public and the stakeholders in the Rochechouart impact and in terrestrial impact structures, in general. A number of smaller visitor centers exist at a variety of impact sites such as, in no particular order, Odessa (Texas-USA), Charlevoix (Quebec-Canada), Campo del Cielo (Argentina), Gardnos (Norway), Lockne (Sweden), and Söderfjärden (Finland). Other plans for visitor centers exist at Vredefort and Tsawai in South Africa, with Vredefort being a designated but not effect ed World Heritage site, also at Siljan (Sweden), Chicxulub (Mexico), Wetumpka, and Flynn Creek (USA), Dellen and several other sites in Sweden, Karikkoselkä, Keurusselkä, Lappajärvi, Saarijärvi, and Summanen in Finland, Morasko in Poland, Bosumtwi (Ghana), and possibly others.

**How:** To be efficient the proposed association of outreach establishments must benefit all members, must be cost-efficient and without intellectual constraints. Ideally, the following rules should apply: no entry fees, all members would be equal and free to contribute on a voluntary basis, and for a win-win scenario. The geographical spread of the concerned structures is such that each could easily promote others without risking local or regional competition. The international dimension of the group and the respective visibilities of the members would then benefit others. Further benefits would come from exchanges (e.g., relevant information, news, return of experience…) in the group. Beyond “networking”, the sites could exchange “materials”. For instance, each associate could provide the others with “matter to show” related to their own site and or initiatives. The members could also combine assets, and possibly join for common initiatives (e.g., joint exhibition/event, specific development such as documentaries, software, and more…). For the developer, this would mean increased visibility, thus promotion of its site and initiatives. For the associate, it would provide collaborative input possibilities, use of materials from others, and the possibility to bring their aspects into the other development. Collaboration — but without obligation. Each member would decide and would be responsible for what he wants to provide to the others. In that context, some members could decide to join forces, or the whole group could join forces for specific projects, such as “a world tour of terrestrial impact craters”. With or without the contribution of the scientific community, the group could also collectively look for international support for some specific projects for education, cultural heritage and geo-tourism related to impact craters on Earth, eventually addressing broader issues and topics, such as preservation of our planet, or the policies to set at the world level in the context of the fast growing future for exploring and exploiting extraterrestrial natural resources (starting with the Moon).

**Conclusion:** The proposed world association of outreach structures (private and public) dedicated to terrestrial impact craters would benefit all. It would benefit the members by increasing their attractiveness/visibility and increase their cost efficiency via mutualization of means and experiences. It would benefit the populations on site through geo-tourism and the public at large by increasing knowledge and quality of tuition about geological and biological processes. The association would serve science, by attracting the youth and motivating decision makers for reinforcing research in this field. In this context, the combined efforts can be seen and advertised as a service to humankind. Preliminary contacts have been made with the managers of the largest structures listed above and communication is in progress. Results will be reported at the conference.

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