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Space inclusiveness and empowerment, or how The (Planetary) Frontier becomes a mirror

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Abstract

We present work conducted in 2010 in the frame of the *Humans in Outer Space (HiOS)* initiative of the European Space Policy Institute (ESPI), Vienna, with the European Science Foundation[1] It has been first published in a slightly longer version (4 pages, 3 figures) in the Springer series *Studies in Space Policy* in 2011 [1], and we attempt here updates of the references two years later, and analysis formulation overhauls.

1. The current values of inclusiveness and empowerment in political and organisational endeavours

At the beginnings of the space age, belief in the world-harmonising virtue of the space frontier is likely to have been a widely shared belief, at least in the leading circles of the developed world. Over the decades, however, the magnitude of the task required such de-humanisation[2] that optimism about such an outcome for space endeavours is likely to have dwindled from its former levels.

We start here from the argument that perspective is a universal empowerment & inclusiveness asset ("teach a man to fish" Chinese proverb). More importantly, perspective sharing can be cost-effective (in the long term), and definitely is environmentally responsible. What perspective and representations

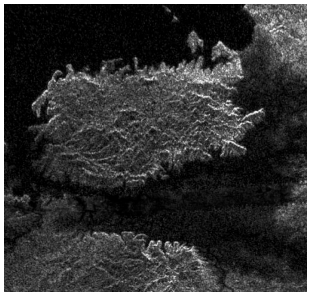

Figure 1: Radar image of Saturn's moon Titan, clearly showing 'hydrological' networks above *and beneath (through)* a sitting liquid surface (lake). The liquid is natural gas (methane). Source: NASA.

(concerning [planetary science-charted] space) can/should we ensure sharing of today, to contribute to a harmonious social tomorrow? Can we bridge the "scale gap" between the evolutionary experience of homo sapiens and outer space? Can we (for the benefit of social interconnection) short-cut some of all that decades-worth of schooling to train our [culturally shared] perception? (And more critically, short-cut some of the social milieu encouraging to stick with that schooling.)

2. The mirror of space: the Common mirror

It appears that we are living in happy times[3]. For almost two decades now, the universe is no longer

1 "Inter-Disciplinary Activities at ESF - Humans in Outer Space (HiOS)". European Science Foundation. May 2010. "[…] *Europe's role among the States conducting [space] exploration. It provides perspectives related to governance, management of space exploration, space settlements, the role of astronauts in the future as well as related to the encounter of extraterrestrial life.*"

2 See Parker, Martin. "Managing Space, Organising the Sublime." in [1] volume.

3 For an extension of this affirmation of optimism to a more prospective subfield of the present topic, see Cockell, Charles - "Habitability". Complete Course in Astrobiology. Eds. Gerda Horneck, and Petra Rettberg. Weinheim: Wiley-VCH Verlag GmbH & Co. KGaA, 2007. 151-76.

exponentially alien with distance, but is starting to form a mirror for us. Each month or so, exoplanets increasingly Earth-like are being detected and make the headlines. Goodbye the scale gap problem. Atmospheres, oceans, rivers are at Our common (for the moment representational[4]) fingertips (Figure 1 for a local solar system preview).

As first pointed out more than half a century ago, extrasolar planet detection is an endeavour that has been accessible to mankind for some time now[5]. Little surprise therefore that big science has been done and probably will still be done with amateur support (see Group "Amateur Astronomy – AM, M. Delcroix, J. Rogers, A. A. Christou, L.N. Fletcher, C. Pellier, R. Miles: conveners, this congress). The first eclipsing exoneptune for instance. The transiting nature of the planet (missed by its professional discoverers) was secured by a transcontinental consortium involving amateurs[6]. Three years later, the first analysis of spectroscopic data from this planet, acquired with the Spitzer Space Telescope, was released[7], demonstrating the pathway leading from ground to space endeavours.

How far beyond the academic and pop culture circles does the impact of this current exploration path reach? One anecdote probably worth mentioning is *New York Times* bestseller on President G.W. Bush's war cabinet having its title reused for the opening review of the 2008 International Astronomical Union symposium on this new particular technique[8]. Meanwhile the involvement of the private[9] and for-profit sector are real. A very recent example of the latter is *Over Sky*, a French-based company, aiming a "private exoplanet search project"[10]. The company is backed by a regular corporation: such 'business models' seem to be fairly common for these types of projects, and in general could be dubbed 'show window-patron symbiosis'[11]. Also note recent though apparently controversial *Uwingu* exoplanet naming company[12] (crowdfunded startup).

It is not only about sharing of perspective and representations, but also effective citizen science[13], [14] fostering. Social inequalities relative to space access rapidly vanish when one considers the scale accessible to simple observation. Observation, after all, is the first step of empowerment. How about a consortium of developing countries discovering what will prove to be the first planet out there likely to bear Earth-like life? Europe has the culture fostering such initiatives. It should not miss the chance[15].

4 Conversely, the recent asteroid mining communication and the recent win-a-one-way-ticket-to-Mars-for-2030 communication <add references here> represent possible near future prospects of enlarged *physical* access planetary science-charted space. Note however that the media (but also, more remarkably, Space Agencies – or at least their communications' departments – appear to systematical omit echoing the potential planetary protection showstopper of the latter case.

5 Struve, Otto. "Proposal for a project of high-precision stellar radial velocity work." The Observatory 72 (1952): 199-200.

6 Gillon, M. et al. "Detection of transits of the nearby hot Neptune GJ 436 b." Astronomy & Astrophysics 472.2.III (2007): L13-L16.

7 Stevenson, Kevin et al. "Possible thermochemical disequilibrium in the atmosphere of the exoplanet GJ 436b." Nature 464.7292 (2010): 1161-4.

8 Mann, James. "Rise of the Vulcans: The History of Bush's War Cabinet", New York: Viking Adult, 2004, cited by Carbonneau, David. "The Rise of the Vulcans", Opening review, International Astronomical Union Symposium 253; "Transiting Planets", May 2008, Boston, 2009: 1-8.

9 E.g. the Las Cumbres Observatory Global Telescope Network, founded by Java billionaire technologist Wayne Rosing.

10 cf. "Over Sky Corporation." Over Sky. May 2010 <http://www.over-sky.fr>

11 It must be noted that corporations are also a common founding choice for non-profit but financially well-off projects that wish to avoid the incumbent administrative and accounting hassles.

12 http://www.space.com/20665-planet-naming-controversy-iau-uwingu.html, 15 April 2013

13 See SETI@home-similar-but-physical (amateur observation) around-the-globe campaign during one month in Spring 2010, attempting to detect a possible eclipse of exoplanet HAT-P-13 c (not occurring – if any – again for another half dozen years). The organization was swift, dormant networks were reactivated, and the Czech Astronomical Society was one of the two major international coordinators of the campaign. At our observatory, we have received that year five (5) requests to work on exoplanets from prep-school students preparing the prestigious "Grandes Ecoles" national contests, for the project part of the contest. (Note that historically few of these graduates actually later choose a career in research.)

14 For the alternate perspective on how public constituency for space projects may arise from exoplanet citizen science, see Dasch, Pat. "Public involvement in extra-solar planet detection". Astrophysics and Space Sciences 241 (1996): 147-53.

15. Also relative to Note 4 on *representational* vs. *physical* space access and its governance: An inclusiveness and empowerment project such as the one outlined here can be exposed to profound structural political anthropology/political philosophy limitations, namely in terms of sovereignty theory. An extensive analysis of this was derived for an extreme prospective child-example [2]; therefore it can likely be easily generalized for the current parent subject here. For an intermediately accessible flavor of the topic see [3] & [4].

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[3] Dominik, M. & Zarnecki, J.eds. "The detection of extraterrestrial life and the consequences for science and society." Philosophical Transactions of the Royal Society, 2011 <find exact URL>.
[4] Dominik, Martin & Zarnecki, John eds. "Towards a scientific and societal agenda on extra-terrestrial life." 4-5 Oct. 2010, Kalvi Royal Society International Centre, Buckinghamshire, London: Royal Society. Jul. 2010.