

## Amara Lynn Graps

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### Outreach Activities: 1994+ (most recent first).

- **Building an Asteroid Mining Community, linking the scientists and the businesses. 2015-** This effort includes the conferences: Asteroid Science Intersections with In-Space Mine Engineering (2016, 2018) with the White Paper (<https://arxiv.org/abs/1612.00709>) and Science Knowledge Gaps to support an asteroid mining roadmap. I am also leading the new In-Space Resource Utilitization group of the Small Bodies Advisory Group for NASA to mimic Luxembourg's process in the US.
- **Building Space Activities for the Baltic Region. 2016-** My largest project –and- outreach work to date has been the development and implementation of the local organizing for the 1000-Abstract, 40 country-participant conference: European Planetary Science Congress 2017 Riga.

The EPSC 2017 was the world's second largest planetary science conference in 2017. I developed and implemented the local organization of a 4-country (FI, EE, LV, LT), nearly 200 person, and 145 KEuro successful effort. With a shorter than usual allocation of time (1.5 years) and no funds from the Europlanet grant agreement or the Latvian government, I built a Baltic-wide program to represent eight Baltic space institutes in the conference (exhibits, booklet), engage the Baltic scientists in the scientific program, employ 6 Baltic students in the ground-floor, fund 25 early-career Baltic students to display their Summer 2017 internship space projects, invite and support 5 Baltic and European government Ministers to give talks, support a Solar System for Kids Exhibit which is expected to reach 10,000 Latvian (600 visited during the conference week, now the Exhibits are on tour throughout Latvia), developed and implemented the Public Event: "Moon, Mars and Beyond", coordinated video recordings, supported the Latvian social event and art-science exhibits and communicated publicly (600 Latvian and International press mentions) about the event and the value of space for the Baltic region. Synopsis: <http://www.balticsinspace.eu/epsc-2017-riga> Seventy-page Outcome Report at Baltics in Space: <https://goo.gl/CiQAEB>

- **Educational Planetary Science Videos for the international youth. 2017-** "What's Wild in the Worlds of Planetary Science?" educational videos from the EPSC 2017 Riga at YouTube: <https://goo.gl/hbdtXL> Currently 19 videos and growing. We will have about 50 in this collection.
- **Building Space Support for Latvia: Latvian Space Portal. 2015-** Co-founder of group to promote space in Latvia. Link to FB group: <https://goo.gl/MLhBEf>.
- **Planetary Climate Education for the international youth. 2014-** *Planet-PI*, a Raspberry-pi community project to measure climate parameters from a sensor-enabled micro-controller, compare with Mars REMS data and other classmates and learn planetary climate physics. This project was originally called: *Climate Detectives* (Dropbox: <https://goo.gl/v5jBj7>) and is managed by the Europlanet-RI-2020 project. We are in the prototype development phase and building the community platform at GlobalLab.
- **"How did Earth get its Water?" 2000s-** Public Education using geochemistry as indicators to answer this decades old question. Lectures : 2009 Southwest Research Institute Colloquium, Boulder, Colorado / 2007 Goldschmidt, Cologne, Germany / 2007 European Geophysical Union, Vienna, Austria. Work with Jonathan Lunine and Alessandro Morbidello in the middle 2000s. That led to a 10 year (!) effort at publication in a popular magazine: it was in the printing queue twice at Scientific American and then I pulled it when they changed the focus and my voice. (2015 version@ Dropbox: <https://goo.gl/QPnnQt>)

- **Astronomy for Poets. 2004–2005** *Adjunct Assistant Professor of Astronomy, American University of Rome, Rome, Italy.* Astronomy instructor for the liberal arts university students. Detailed course syllabus from the web site : Export of Page @ Dropbox: <https://goo.gl/oxyKMw>
- **Dusty Phenomena. 1998–2005** I handled many of the Outreach activities in my Max Planck Institute for Kernphysik in Heidelberg dust group when I was there late 1990s–early 2000s for my PhD and postdoc. My Essay on Dust Evolution (Wayback machine: <https://goo.gl/nLfVlf>) found its way to Wikipedia. Wrote the Dust Glossary (Wayback machine: <https://goo.gl/9TpgyA>). Co-Editor with H. Krueger of book we produced in LaTeX of 55 articles: *Proceedings of the Dust in Planetary Systems* (Workshop, Sept 26–30, 2005, Kauai, Hawaii), SP-643 January 2007. Proceedings @ NASA-ADS: <https://goo.gl/qobuBD> Modified TeX scripts and typeset the book: *Interplanetary Dust* by Gruen, Gustafson, Dermott, and Fechtig (eds.), Springer-Verlag, 2001. In addition to the group web site, my outreach work led to: Amara Graps and Antal Juhasz (2001). “Dusty Phenomena in the Solar System”, *Sky & Telescope*, January 2001, pp 56–63. (Dropbox: <https://goo.gl/XnSjZE>)
- **Introduction to Wavelets. Graps, A.L. 1995–2013**; “An Introduction to Wavelets”, *IEEE Computational Sciences and Engineering*, Summer 1995, pp 50–61 (Dropbox: <https://goo.gl/1W45XH>). I built a detailed educational web site to educate the newbie to wavelets starting with the references used for this paper. This paper was cited 2000 times, was downloaded at my old Intro to Wavelets site at amara.com (Wayback machine: <https://goo.gl/4jLKdg>) by approximately 200,000 people since its publication in 1995 and has been referenced in papers, theses and books including: *The Illustrated Wavelet Transform Handbook* by Paul S. Addison (Institute of Physics Publishing, 2002), *The World According to Wavelets* by Barbara Hubbard (2000, AK Peters), and *Discovering Wavelets* by Edward Aboufadel and Steven Schlicker (1999, Wiley), and in hundreds of web sites.

### I presented my introduction to wavelets topic at:

- 2008 Southwest Research Institute Colloquium, Boulder, Colorado / 2003 ESC: Seismic Signals Related to Volcanic Unrest, Pantelleria, Italy / 2002 Etamax, Braunschweig, Germany / 1999 TU-München, Fachgebiet Raumfahrttechnik, Garching bei München, Germany / 1998 Cornell Astronomy Seminar, Ithaca, NY / 1997 One-day Workshop: for SmallTalk inventors: Alan Kay, Dan Ingalls plus Ted Kaehler and the rest of their Squeak Group (Disney), Palo Alto, CA / 1996 Stanford Helioseismology Seminar, Stanford, CA / 1995 Scientific & Engineering Applications on the Macintosh, San Francisco, CA.
- **Computing Education to my NASA-Ames colleagues: 1993–1994.** Chief Editor of *Digital Explorations Newsletter*, published ‘in-house’ about every two months, while I worked at NASA-Ames. (First and Second edition at Dropbox: 1<sup>st</sup>: <https://goo.gl/YvYX2d>, 2<sup>nd</sup>: <https://goo.gl/tnm1tB>)

### Other Popular Science Writings

- **Amara’s Recap of N-body Methods. 1995–2000.** (Wayback Machines: <https://goo.gl/rrjLDG>)
- **Amara’s Repetitive Strain Injury Page. 1994–2000.** (Export of Page @ Dropbox: <https://goo.gl/r237kd>)
- **1994–2000. Miscellaneous popular science topics:** Dusty Trail from the Solar Nebula to the Earth, Bayesian Probability Theory, Procedure to model a Star's Interior and Evolution, The Physics of Traffic Flows, Monte Carlo Simulation in a Nutshell, Overview of the Three-Body Problem, List of 100 Brightest Nearby sun-like stars, Why the Moon doesn't fall, Why Hot Water Freezes First, Why a Boomerang Returns. (Export of Page @ Dropbox: <https://goo.gl/WaVDh7>)