

# Colin Goldblatt

Curriculum vitae – updated 26<sup>th</sup> November 2010

Research Associate

Virtual Planetary Laboratory & Astronomy Department,

Box 351580, University of Washington, Seattle, WA 98195, U.S.A.

Tel.: (+1) 206-685-9237

cgoldbla@uw.edu – www.colingoldblatt.net

## Postdoctoral Employment

- 2010 – present      Research Associate, Virtual Planetary Laboratory & Astronomy Department, Box 351580, University of Washington, Seattle, WA 98195, U.S.A.  
Advisor: Prof Vikki Meadows
- 2008 – 2010        NASA Postdoctoral Program Fellowship, NASA Ames Research Center, California, U.S.A.  
Advisor: Dr Kevin Zahnle
- 2008 – 2008        Research Assistant, School of Environmental Sciences, University of East Anglia, U.K.  
Advisor: Prof. Tim Lenton

## University Education

- 2005 – 2008        PhD, School of Environmental Sciences, University of East Anglia, U.K.  
*Bistability of atmospheric oxygen, the Great Oxidation and climate*  
Supervisors: Prof. Tim Lenton and Prof. Andy Watson FRS.
- 2003 – 2005        PhD student, School of Geographical Sciences, University of Bristol, U.K.  
Transferred to UEA when Prof. Lenton moved to UEA.
- 1999 – 2003        BSc(Hons) Meteorology and Oceanography, Class I,  
Schools of Environmental Sciences and Mathematics, University of East Anglia, U.K.  
Including academic year 2001 – 2002 as:  
Exchange Student, University of Colorado, USA.

## Awards

- 2008                Editors' Citation for Excellence in Refereeing for Global Biogeochemical Cycles.
- 2003                Prize for best final year project, School of Environmental Sciences, University of East Anglia.
- 2001                Ede and Ravencroft Prize for significant academic and extra curricular achievement, University of East Anglia.

## Grants

- 2010 – 2014        NASA Planetary Atmospheres Grant (US\$300,000)
- 2008 – 2010        NASA Postdoctoral Program Fellowship (US\$120,000)
- 2007                Goldschmidt Student Travel Grant (€500)
- 2007                Bioastronomy Meeting Student Travel Grant (US\$1760)
- 2003 – 2007        CASE award, Centre for Ecology and Hydrology (£3000)
- 2003 – 2007        NERC Algorithm PhD Studentship (£55,000)

## Professional Service

- Reviewer for:     *Global Biogeochemical Cycles*  
                         *Geophysical Research Letters*  
                         *Astronomy and Astrophysics*  
                         *Earth and Planetary Science Letters*  
                         *Astrobiology*

Session organiser for:

*AGU Fall Meeting 2010: P03 - Evolution of Planetary Atmospheres*  
*Goldschmidt 2010: 01e - Mantle-Atmosphere Interactions on Earth and Beyond.*

Review Panel member for:

*NASA Planetary Atmospheres Program, 2010*  
*NASA Astrobiology Science, Technology & Engineering Program (ASTEP), 2010*

Science Team member for:

*European Venus Explorer (EVE) mission*

## Journal articles

- K. Mullins, R. Barnes, **C. Goldblatt** and V. Meadows, The past and future role of tides on terrestrial exoplanets, in preparation for *Astrobiology*.
- C. Goldblatt** and K. J. Zahnle, Faint Young Sun Paradox Remains, *Nature*, accepted subject to minor revisions (manuscript available on request).
- M. S. Marley, D. Saumon and **C. Goldblatt**, A Patchy Cloud model for the L to T Dwarf Transition, *Astrophys. J. Lett.*, 723(1), L117, 2010, doi:10.1088/2041-8205/723/1/L117.
- C. Goldblatt** and K. J. Zahnle, Clouds and the Faint Young Sun Paradox, *Clim. Past Discuss.*, 6, 1163-1207, 2010, doi: 10.5194/cpd-6-1163-2010.
- C. Goldblatt**, N. Sleep, K. J. Zahnle and E. G. Nisbet, The Eons of Chaos and Hades, *Solid Earth*, 1, 1-3, 2010, doi:10.5194/se-1-1-2010.
- C. Goldblatt**, A. J. Watson and T. M. Lenton, Bistability of atmospheric oxygen and the Great Oxidation: implications for life detection, *Proceedings of Bioastronomy 2007, ASP Conf. Ser.*, 420, 277-285, 2009.
- C. Goldblatt**, A. J. Matthews, M. W. Claire, T. M. Lenton, A. J. Watson and K. J. Zahnle, Nitrogen-enhanced greenhouse warming on early Earth, *Nature Geoscience*, 2(12), 891-896, 2009, doi:10.1038/ngeo692.
- C. Goldblatt**, T. M. Lenton and A. J. Watson, An evaluation of the longwave radiative transfer code used in the Met Office Unified Model, *Quart. J. Roy. Met. Soc.*, 135(640), 619-633, 2008, doi:10.1002/qj.403.
- M. T. Johnson, N. E. Vaughan, P. Goodwin, **C. Goldblatt**, S. Roudesl and T. M. Lenton, Why NH<sub>3</sub> Is Not a Candidate Reagent for Ambient CO<sub>2</sub> Fixation: A Response to “Alternative Solution to Global Warming Arising from CO<sub>2</sub> Emissions—Partial Neutralization of Tropospheric H<sub>2</sub>CO<sub>3</sub> with NH<sub>3</sub>”, *Environ. Prog.*, 27(3), 412-417, 2008, doi:10.1002/ep.10298.
- C. Goldblatt**, T. M. Lenton and A. J. Watson, Bistability of atmospheric oxygen and the Great Oxidation, *Nature*, 443, 683-686, 2006, doi:10.1038/nature05169.
- K. W. Nicholls, et al. [22 authors including **C. Goldblatt**], Measurements beneath an Antarctic ice shelf using an autonomous underwater vehicle, *Geophys. Res. Lett.*, 33, L08612, 2006, doi:10.1029/2006GL025998.

## Conference presentations & invited meeting attendance

### Forthcoming:

**Invited:** **C. Goldblatt**, Clouds and the Faint Young Sun Paradox, *Goldschmidt*, 14–19 August 2011, Prague, Czech Republic.

**Oral:** **C. Goldblatt**, How do we solve the Faint Young Sun Paradox? Examining diverse proposed atmospheres for Early Earth, *AGU Fall Meeting*, 13-17 December 2010, San Francisco, U.S.A.

### Previous:

**Invited, oral:** **A. J. Watson** and **C. Goldblatt** (co-presented), The Runaway Greenhouse - the last great geoengineering challenge, *Royal Society Discussion Meeting on Geoengineering*, 8–9 November 2010, London, U.K.

**Invited discussant**, NASA Astrobiology Institute workshop *Redefining the Habitable Zone*, 4–6 August 2010, Seattle, U.S.A.

**Poster:** **C. Goldblatt**, The subduction origin of mantle nitrogen, *Goldschmidt*, 14–18 June 2010, Knoxville, U.S.A.

**Poster: C. Goldblatt.** Whitewashed ground or real clouds? Explicit representation of the radiative properties of clouds brings the outer edge of the habitable zone inward and cools the early Earth, *AGU Fall Meeting*, 14–18 December 2009, San Francisco, U.S.A.

**Invited discussant,** Agouron Institute workshop *Nitrogen*, October 2009, Scotsdale, U.S.A.

**Oral: C. Goldblatt.** A. J. Matthews, M. Claire, T. M. Lenton, A. J. Watson and K. J. Zahnle, Nitrogen as a resolution of the Faint Young Sun Paradox, *Astrobiology Graduate Conference (AbGradCon)*, 17–20 July 2009, Seattle, U.S.A.

**Poster: C. Goldblatt.** A. J. Matthews, M. Claire, T. M. Lenton, A. J. Watson and K. J. Zahnle, Nitrogen as a resolution of the Faint Young Sun Paradox, *The Royal Meteorological Society Conference*, 29 June–2 July 2009, Reading, United Kingdom.

**Poster: C. Goldblatt,** T. M. Lenton and A. J. Watson, An evaluation of the longwave radiative transfer code used in the Met Office Unified Model, *The Royal Meteorological Society Conference*, 29 June–2 July 2009, Reading, United Kingdom.

**Oral: C. Goldblatt.** A. J. Matthews, M. Claire, T. M. Lenton, A. J. Watson and K. J. Zahnle, There was probably more nitrogen in the Archean atmosphere - this would have helped resolve the Faint Young Sun paradox, *Goldschmidt*, 21–26 June 2009, Davos, Switzerland.

**Poster: C. Goldblatt.** A. J. Matthews, T. M. Lenton, A. J. Watson and K. J. Zahnle, The nitrogen content of the early atmosphere: climatic consequences and surface–geosphere exchange, *Developments In Noble Gas Understanding and Expertise (DINGUE) workshop*, 19–20 June 2009, Nancy, France.

**Invited, oral: C. Goldblatt,** A. J. Matthews, T. M. Lenton, A. J. Watson and K. J. Zahnle, The Global Nitrogen Budget and the Faint Young Sun Paradox, *AGU Fall Meeting*, 15–19 December 2008, San Francisco, U.S.A.

**Poster: C. Goldblatt,** T. M. Lenton and A. J. Watson, Bistability of atmospheric oxygen and the Great Oxidation: implications for life detection, *Royal Society discussion meeting: Photosynthetic and atmospheric evolution*, 12–13 November 2007, London, U.K.

**Oral: C. Goldblatt,** T. M. Lenton and A. J. Watson, Bistability of atmospheric oxygen and the Great Oxidation, *Goldschmidt*, 20–24 August 2007, Cologne, Germany.

**Oral: C. Goldblatt,** T. M. Lenton and A. J. Watson, Bistability of atmospheric oxygen and the Great Oxidation: implications for life detection, *Bioastronomy 2007*, 15–19 July, Puerto Rico.

**Poster: C. Goldblatt,** T. M. Lenton and A. J. Watson, Bistability of atmospheric oxygen and the Great Oxidation: implications for life detection, *Astrobiology Graduate Conference (AbGradCon)*, 13–14 July 2007, Puerto Rico.

**Poster: C. Goldblatt,** T. M. Lenton and A. J. Watson, The Great Oxidation at ~2.4 Ga as a bistability in atmospheric oxygen due to UV shielding by ozone, *European Geosciences Union*, 2–7 April 2006, Vienna, Austria.

**Oral: C. Goldblatt,** A. J. Watson and T. M. Lenton, Multiple extreme glaciations in the Palaeoproterozoic: coupled climate biogeochemical dynamics, *Earth System Processes II*. 8–11 August 2005, Calgary, Canada.

## Departmental Seminars

Astrobiology Program, University of Washington, *Early Earth nitrogen: geosphere-biosphere-climate interactions* (30 November 2010).

Hadley Centre, UK Met Office, The Runaway greenhouse (19 November 2010).

Earth Sciences, Oxford University, *Early Earth nitrogen: geosphere-biosphere-climate interactions* (15 November 2010).

Met, Ocean and Climate seminar series, School of Environmental Sciences, University of East Anglia, U.K., *A double bill of radiative transfer with a bit of geochemistry thrown in for fun: An evaluation of the longwave radiative transfer code used in the Met Office Unified Model followed by solving the Faint Young Sun Paradox with nitrogen* (10 July 2009).

Earth Science, University of Durham, U.K., *Geological and atmospheric nitrogen budgets on the Faint Young Sun paradox* (6 July 2009).

Space Science Seminar Series, NASA Ames Research Center, California, U.S.A., *The N<sub>2</sub> inventory of the Early Earth atmosphere: Climatic consequences and surface-mantle geochemical cycling* (21 January 2009).

Earth and Planetary Sciences, University of California Santa Cruz, U.S.A., *The global nitrogen cycle and the faint young sun paradox* (17 October 2008).

Space Science Division, NASA Ames Research Center, California, U.S.A., *Bistability of atmospheric oxygen: understanding the Great Oxidation and finding other planets* (8 February 2007).

Geochemical Luncheon Club, School of Environmental Sciences, University of East Anglia, U.K., *The Great Oxidation at ~2.4 Ga as a bistability in atmospheric oxygen* (23 January 2006).

## **Education and Outreach**

Ohlone College “NASA Night” Seminar. Presentation to overflowing 400 seat auditorium. *Astrobiology: looking for life elsewhere in the universe* (10 November 2009)

San Jose Tech Museum Space Week. Talks to museum visitors, both school children and adults. *Life and planetary atmospheres: Earth and beyond* (22 July 2009).

NASA Digital Learning Network. Broadcast seminar to high school and middle school students. *Life and planetary atmospheres: Earth and beyond* (1 April 2009, 16 June 2009 & 3 March 2010).

## **Research level courses and training**

Sept 2004            Earth System Sciences Summer School, University of Reading, UK.

Jan – Feb 2004    European Research Course in Atmospheres (ERCA), Grenoble, France.

June – Aug 2002   Summer Student Fellowship, Woods Hole Oceanographic Institution, MA, USA.

## **Fieldwork experience**

Jan – Feb 2004    Five week research cruise on *RRS James Clark Ross* in the Southern Ocean. Responsibilities included operating CTD, processing hydrographic data and general watchkeeping duties.

Aug 2003           Field Assistant on geomorphological fieldwork in north-east Iceland.