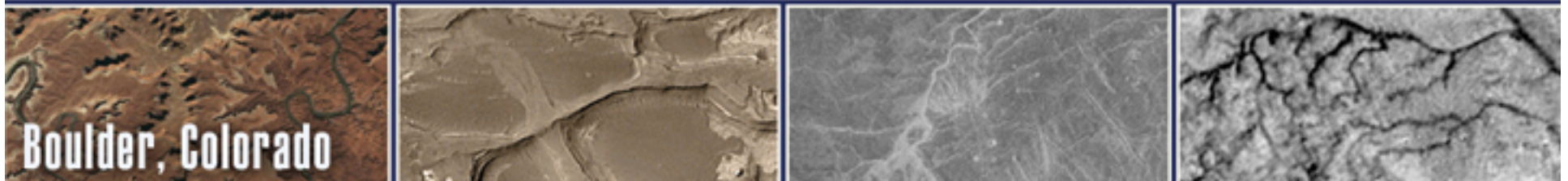
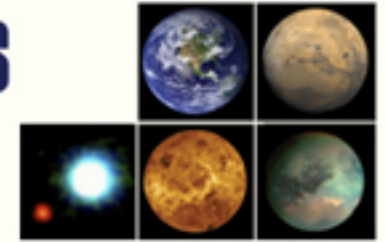


# Comparative Climatology of Terrestrial Planets

June 25–28, 2012

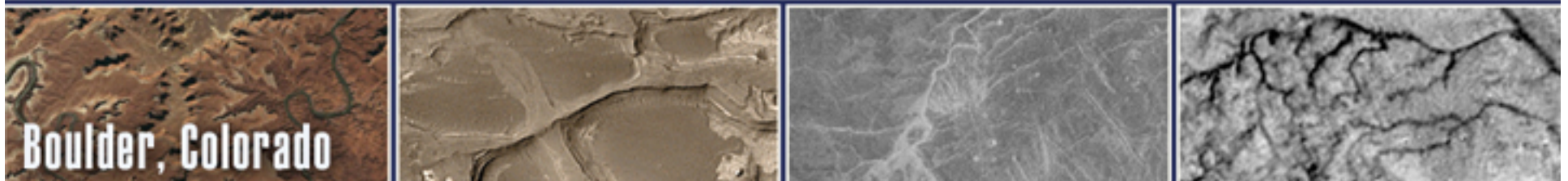
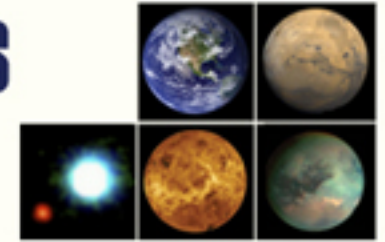


## Major Themes

- Climate Change on Earth and Terrestrial Planets
- Earth Terrestrial Planet Climate Models
- Exoplanet Atmospheres – Chemistry and Observations
- Solar-Atmosphere Interactions
- Interior-Atmosphere Interactions
- Geology and Climate on Terrestrial Planets

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012

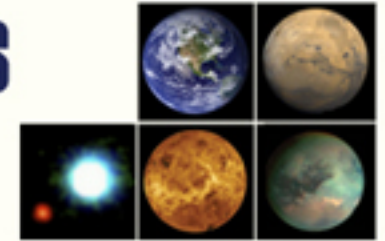


## Purpose

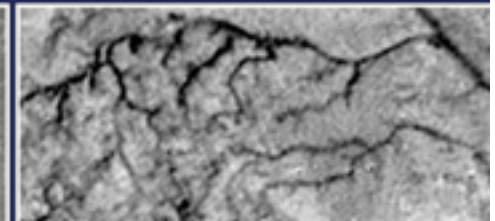
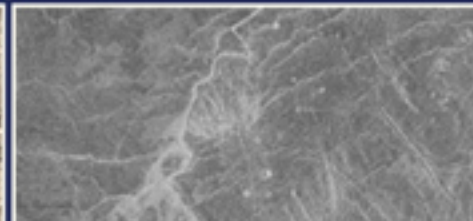
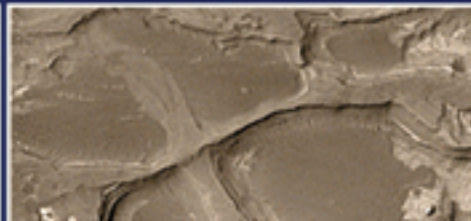
- Identify and explore physical and chemical processes that are shared among rocky planets.
- Advance scientific progress through detailed, interdisciplinary comparisons between Earth, Mars, Venus, Titan, and planets around other stars.
- Compare energy balance, climate forcing, photochemistry, clouds and aerosols, exospheric processes, magnetic fields, surface-atmosphere interactions, atmospheric dynamics, geology, mantle convection, and impacts on terrestrial planets.
- Observation and modeling of physical processes operating in different contexts for a deeper understanding and improved predictive power.

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



Boulder, Colorado

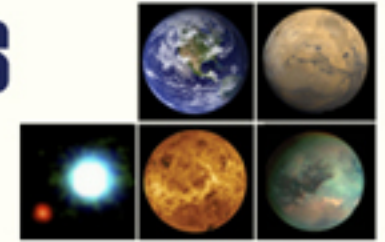


## Scientific Organizing Committee

Mark Bullock	SwRI
Lori Glaze	NASA GSFC
Steve Bougher	U of Michigan
Brian Drouin	JPL
David Grinspoon	DMNS
Jeff Hollingsworth	NASA Ames
Sanjay Limaye	U of Wisconsin
Richard Eckman	NASA Earth Science
Adriana Ocampo	NASA Planetary Sciences
Madhulika Guhathakurta	NASA Heliophysics
Whaleed Abdalati	NASA Chief Scientist
Steve Mackwell	LPI
Doug Rabin	NASA Heliophysics
Sue Smrekar	JPL
Wes Traub	JPL
Doug Hudgins	NASA Astrophysics
Mario Perez	NASA Astrophysics

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



## Location

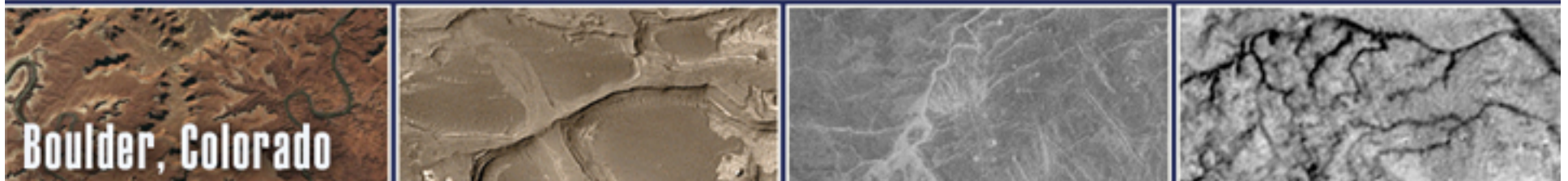
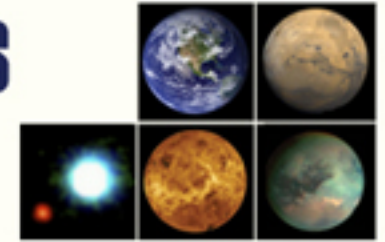
Hotel Boulderado in Boulder, Colorado

- Centrally located for international participants.
- Regional center for atmospheric & planetary studies (NCAR, NOAA, InStarr, LASP, SwRI, CU).
- Poster session across the street in an art gallery.
- Poster previews running continuously in meeting lobby.
- Walking distance to public event on June 26 at the Boulder Theater.
- Walking distance to all amenities



# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



## Sponsors

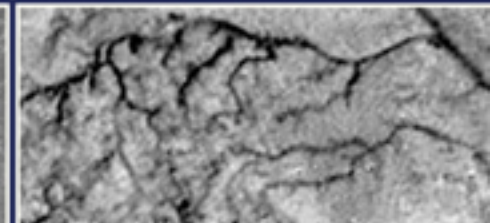
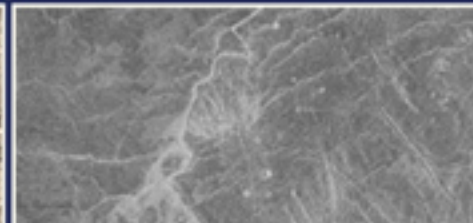
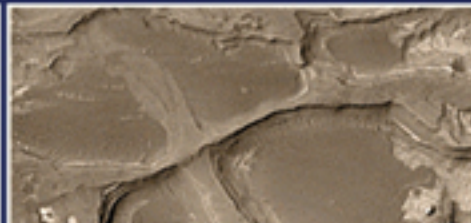
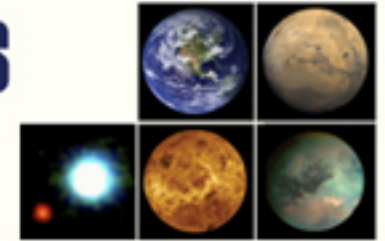
- NASA
  - Planetary Science Division
  - Earth Sciences Division
  - Heliophysics Division
  - Astrophysics Division
  - Chief Scientist
- SwRI
- Lunar and Planetary Institute (USRA)
- LASP
- IUGG/IAMAS/ICPAE
- Planetary Society



IUGG/IAMAS/ICPAE

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



Lennart	Bengtsson	Jefferey	Hollingsworth
Stephen	Bougher	Alan	Howard
David	Brain	Yohai	Kaspi
Mark	Bullock	Sebastien	Lebonnois
Mike	Coffin	Christopher	Lee
Curt	Covey	Franck	Montmessin
Tom	Cravens	Jeff	Moore
David	Crisp	David	Pawlowski
Lindy	Elkins-Tanton	Ray	Pierrehumbert
Francois	Forget	Scot	Rafkin
Eric	Gaidos	V. (Ram)	Ramanathan
Lori	Glaze	Peter	Read
David	Grinspoon	Gavin	Schmidt
James	Hansen	Jerry	Schubert
Jacob	Haqq-Misra	Adam	Showman
Joe	Harrington	Suzanne	Smrekar

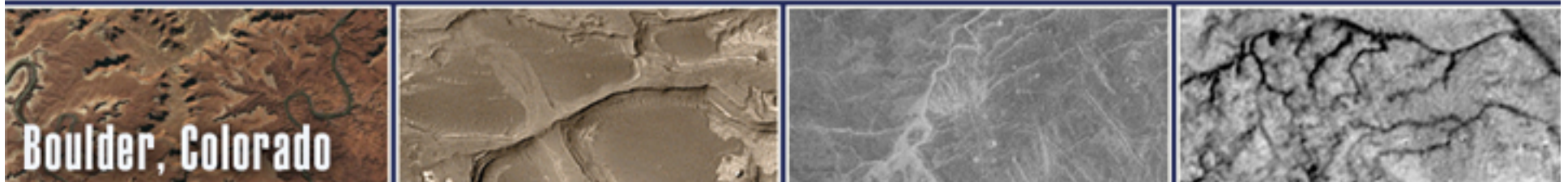
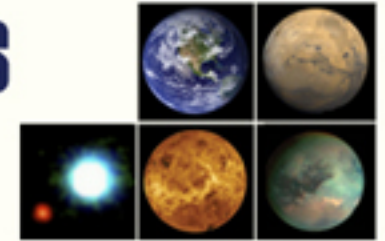
## Over 40 Invited Speakers and 60 Poster Presentations

Stanley	Solomon	Feng	Tian
Christophe	Sotin	Brian	Toon
Graeme	Stephens	Allan	Treiman
Alan	Stern	Channon	Visscher
Mark	Swain	Tom	Woods



# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



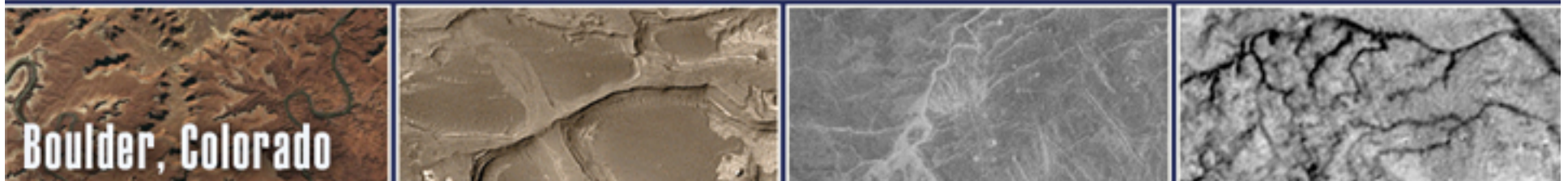
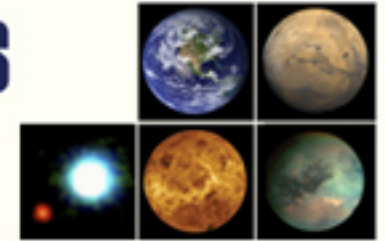
## 2012 Planetary Decadal Survey

- Comparative studies of climate change on the inner planets can provide context and deeper understanding of the history of Earth's climate.
- Need a better understanding of the dynamics of complex nonlinear climate systems.
- Need to better estimate the strengths of climate forcings and the sensitivity of the climate system to various feedback mechanisms.
- Understand the effects of outgassing (volcanic and other) fluxes on the climate balances of terrestrial planets.
- Validate the techniques and models used for terrestrial climate predictions by determining their ability to understand non-terrestrial climates.

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012

SCIENTIFIC PROGRAM



## Monday, June 25, 2012

- 8:15 a.m. Boulderado Ballroom [Climate Change on Earth and the Terrestrial Planets](#)
- 11:00 a.m. Boulderado Ballroom [Terrestrial Planet Climate Models](#)
- 1:30 p.m. Boulderado Ballroom [Exoplanet Atmospheres](#)
- 4:00 p.m. Boulderado Ballroom [NASA Perspectives on Comparative Climate Research](#)

## Tuesday, June 26, 2012

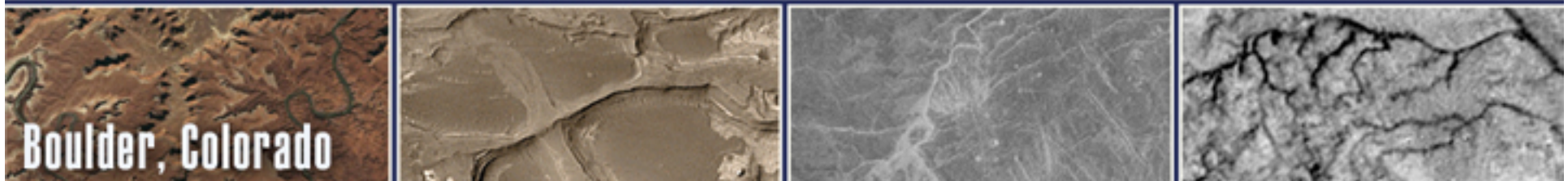
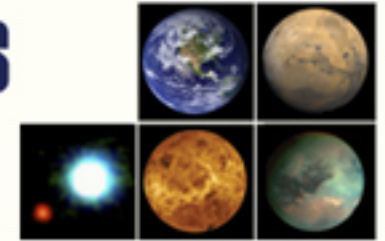
- 8:30 a.m. Boulderado Ballroom [Earth and Terrestrial Planet Climate Models](#)
- 11:00 a.m. Boulderado Ballroom [Terrestrial Planet Atmospheres](#)
- 3:30 p.m. Boulderado Ballroom [Exoplanet Observations and Chemistry](#)
- 4:30 p.m. Boulderado Ballroom [Comparison of Radiative Effects of Clouds on Earth and the Terrestrial Planets](#)
- 8:00 p.m. Boulder Theater Public Event with Bill Nye (“The Science Guy”) “Climate Change on Earth and Other Planets,” a public Q&A event with panelists Jim Hansen, Brian Toon, and David Grinspoon



# Comparative Climatology of Terrestrial Planets

June 25–28, 2012

SCIENTIFIC PROGRAM



## Wednesday, June 27, 2012

- 8:30 a.m. Boulderado Ballroom [Solar-Atmosphere Interactions](#)
- 11:00 a.m. Boulderado Ballroom [Interior-Atmosphere Interactions](#)
- 1:30 p.m. Boulderado Ballroom [Geology and Climate on the Terrestrial Planets](#)
- 5:30 p.m. Rembrandt Yard Poster Session and Reception

[\*Terrestrial Planet Atmospheres and Climates: Observational Basis\*](#)

[\*Terrestrial Planet Atmospheres and Climates: Theory and Models\*](#)

[\*Photochemistry\*](#)

[\*Exoplanet Atmospheres\*](#)

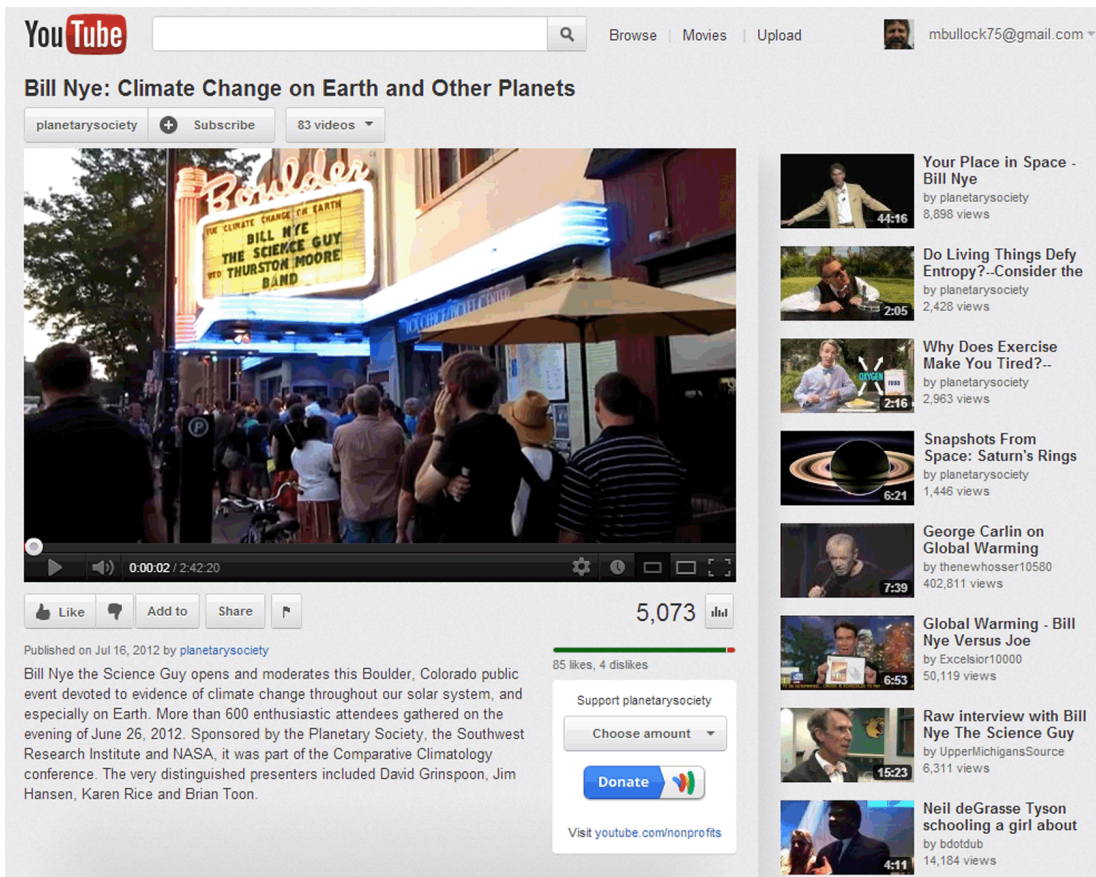
[\*Solar-Atmosphere Interactions\*](#)

[\*Interior-Surface-Atmosphere Interactions\*](#)

## Thursday, June 28, 2012

- 8:30 a.m. Boulderado Ballroom [Solar Effects on Terrestrial Planet Climates](#)
- 10:30 a.m. Boulderado Ballroom [Terrestrial Planet Exploration](#)
- 1:30 p.m. Boulderado Ballroom [Terrestrial Planet Climate](#)
- 4:00 p.m. Boulderado Ballroom [Plan Forward for Comparative Climatology](#)

# Public Panel Discussion



The image shows a YouTube video player interface. The video title is "Bill Nye: Climate Change on Earth and Other Planets" by the channel "planetarysociety". The video has 5,073 likes and 4 dislikes. The video description states: "Published on Jul 16, 2012 by planetarysociety. Bill Nye the Science Guy opens and moderates this Boulder, Colorado public event devoted to evidence of climate change throughout our solar system, and especially on Earth. More than 600 enthusiastic attendees gathered on the evening of June 26, 2012. Sponsored by the Planetary Society, the Southwest Research Institute and NASA, it was part of the Comparative Climatology conference. The very distinguished presenters included David Grinspoon, Jim Hansen, Karen Rice and Brian Toon." Below the description is a "Support planetarysociety" section with a "Donate" button and a link to "Visit youtube.com/nonprofits". To the right of the video player is a list of recommended videos:

- Your Place in Space - Bill Nye by planetarysociety 8,898 views
- Do Living Things Defy Entropy?--Consider the by planetarysociety 2,428 views
- Why Does Exercise Make You Tired?-- by planetarysociety 2,963 views
- Snapshots From Space: Saturn's Rings by planetarysociety 1,446 views
- George Carlin on Global Warming by thenewhoser10580 402,811 views
- Global Warming - Bill Nye Versus Joe by Excelsior10000 50,119 views
- Raw interview with Bill Nye The Science Guy by UpperMichigansSource 6,311 views
- Neil deGrasse Tyson schooling a girl about by bdotdub 14,184 views

## Climate Change on Earth and Other Planets

Moderated by Bill Nye

Sponsored by The Planetary Society at the Boulder Theater June 26, 2012

Panel Discussion with

- James Hansen
- Brian Toon
- David Grinspoon
- Karen Rice

• Entire event video archived at

• <http://www.youtube.com/watch?v=CVcoEP8z2Q0&feature>

# Boulder

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Thurs Aug 9 / fun. / Citizen Cope / GIVERS  
Fri Aug 10 / Alabama Shakes / Good Old War / Allen Stone

### EVENTS



**JUN 23** BILL FRISSELL EXPLORES THE MUSIC OF JOHN LENNON

**JUN 26** CLIMATE CHANGE ON EARTH AND OTHER PLANETS FEAT. BILL NYE THE SCIENCE GUY

**JUN 27** THURSTON MOORE BAND

**JUN 29** SMOOTH MONEY GESTURE FEAT. THE MILE HIGH HORNS PLAYS THE BAND & AFRO-ZEP

**JUN 30** ROB DRABKIN PERFORMING GRACELAND

**JUL 03** LUCERO

**JUL 04** EMINENCE ENSEMBLE

**JUL** PORTER ROBINSON

## CLIMATE CHANGE ON EARTH AND OTHER PLANETS FEAT. BILL NYE THE SCIENCE GUY

26 TUE JUN



BUY TICKETS >>

BOULDER THEATER

Price: ..... \$10 General Admission Seated  
Doors: ..... 7:30 PM  
Show: ..... 8:00 PM  
Age Policy: ..... All Ages  
Status: ..... On Sale

\*\*\*tax and service charges will apply

\*\*\*prices are the same on the web, phone & box office

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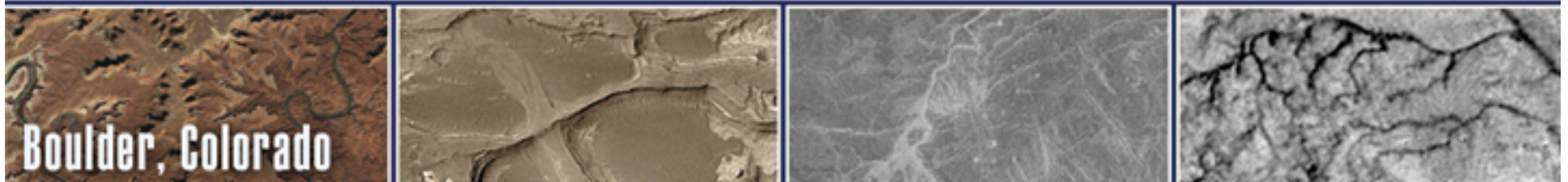
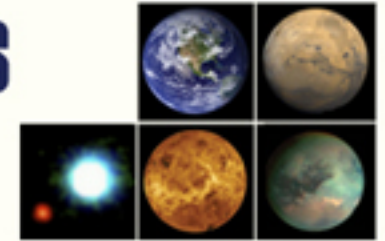
t Tweet 25

"Climate Change on Earth and Other Planets" will feature a keynote address from Bill Nye and short presentations from a panel of distinguished climate scientists, including Dr. Jim Hansen (Goddard Institute for Space Studies), Dr. David Grinspoon (Denver Museum of Nature and Science), and Dr. Brian Toon (Laboratory for Atmospheric and Space Physics). The panel, moderated by Bill Nye, will answer questions from the audience and lead a discussion on Earth's climate and comparisons with other solar system planets.

Weblink: <http://www.lpi.usra.edu/meetings/climatology2012/>

# Comparative Climatology of Terrestrial Planets

June 25–28, 2012



## The Future of Comparative Climatology of Terrestrial Planets

- CCTP Executive Summary  
<http://www.lpi.usra.edu/meetings/climatology2012/CCTPExecutiveSummary.pdf>
- CCTP White Paper – end of 2012
- University of Arizona Press, *Comparative Climatology of Terrestrial Planets*, editors Stephen Mackwell, Mark Bullock, Jerry Harder. To be published Fall 2013
- CCTP Steering Committee from conference SOC remains active (e.g. this talk)
- CCTP Steering Committee – provide input to use CCTP approach for addressing challenging multidisciplinary problems in Planetary, Earth Sciences, Heliophysics and Exoplanet research.

