

# COE CST Fourth Annual Technical Meeting

## Task 193: Role of COE CST in EFP

**PI: George H. Born  
Bradley Cheetham**

*October 29-30, 2014  
Washington, DC*



# Agenda

- Team Members
- Purpose of Task
- ESIL
- Other Support
- Publications
- Next Steps
- Contact Information

# Team Members

- **George H. Born** – Director Emeritus, Colorado Center for Astrodynamics Research
- **Bradley Cheetham** – Graduate Research Assistant, CU Boulder, Aerospace Engineering Sciences

## Stanford Support:

- **Jonah Zimmerman**
- **Andrew Ow**

# Team Members – Sponsors



# Team Members – Supporters

- William Pomerantz – Virgin Galactic
- Greg Autry – UC Irvine
- Scott Hubbard – Stanford Univ.
- Dan Lopez – Urthecast
- Julian Mann – Skybox
- Art Anisimov – Dauria Aerospace
- Jordon Croom – SSL
- Ward Hanson – SIEPR
- Bruce Pittman – NASA
- Steve Jurvetson – DFJ
- Robert Lightfoot – NASA
- George Nield – FAA
- David Brandt – LMCO
- A.C. Charania – Virgin Galactic
- Charles Miller
- Mischa Fisher
- Carissa Christensen – Tauri Group
- Richard Dalbello - OSTP
- Lori Garver - ALPA

# Task Purpose

## Objectives:

- Identify key industry characteristics to facilitate EFP efforts
- Host targeted workshops to engage students and young professionals
- Support conferences to educate students and young professionals
- Incorporate young professional perspectives in ongoing industry planning efforts

# COE Research Objectives

## Research

- Products of workshop and ongoing EFP supporting activities

## Training

- Emerging Space Industry Leaders Workshop Series

## Outreach

- Disseminating activity results, promoting a broader understanding of commercial space

# ESIL Workshops

- Emerging Space Industry Leaders Workshop series
- Objectives:
  - Inform – perspective, background, context
  - Perform – group analysis
  - Network – internal and external to industry
- Impact:
  - 83 participants
  - 3 publications complete



# ESIL-01 – October 2011

- 26 participants
- Industry segments:
  - Point-to-point
  - Lunar Mining
  - Hosted Payloads
- Guest Contributors
  - Dennis Stone – NASA JSC
  - Max Vozoff – mv2space
  - Diane Dimeff - eSpace



# ESIL-02 – March 2012

- 12 Participants
- Industry focus:
  - Government role in commercial space
- Guest contributors
  - Richard Dunn – DoD Acq.
  - Chris Shank – dCoS L. Smith
  - Alan Ladwig – NASA HQ
  - James Finch – OSD
  - Jim Van Laak – FAA AST
  - Clay Mowry - Arianespace



# ESIL-03 – November 2012

- 10 Participants
- Industry focus:
  - Commercial human spaceflight training
- Guest Contributors
  - Brienna Henwood



Pictured (L to R): Nathan Wong, John Stark, Ken Davidian, Brad Cheetham, Kaizad Raimalwala, Matt Cannella, Brienna Henwood, Liz Kennick, Sirisha Bandla, Jules Feldhacker, Jim Crowell.

# ESIL-04 – June 2013

- 14 Participants
- Industry focus:
  - Microgravity utilization
- Guest contributors:
  - Sirisha Bandla – CSF
  - Cassie Kloberdanz – SNC
  - Dan Durda – SwRI
  - Khaki Rodway – XCOR



# ESIL-05 – November 2013

- 5 Participants
- Industry focus:
  - Smallsat dedicated launcher
- Guest Contributors:
  - William Pomerantz – Virgin Galactic

# ESIL-06 – May 2014

- 7 Participants
- Industry focus:
  - Commercial remote sensing
- Guest Contributors:
  - Greg Autry – UC Irvine
  - Scott Hubbard – Stanford Univ.
  - Dan Lopez – Urthecast
  - Julian Mann – Skybox
  - Art Anisimov – Dauria Aerospace
  - Jordon Croom – SSL
  - Ward Hanson – SIEPR
  - Bruce Pittman – NASA
  - Steve Jurvetson – DFJ

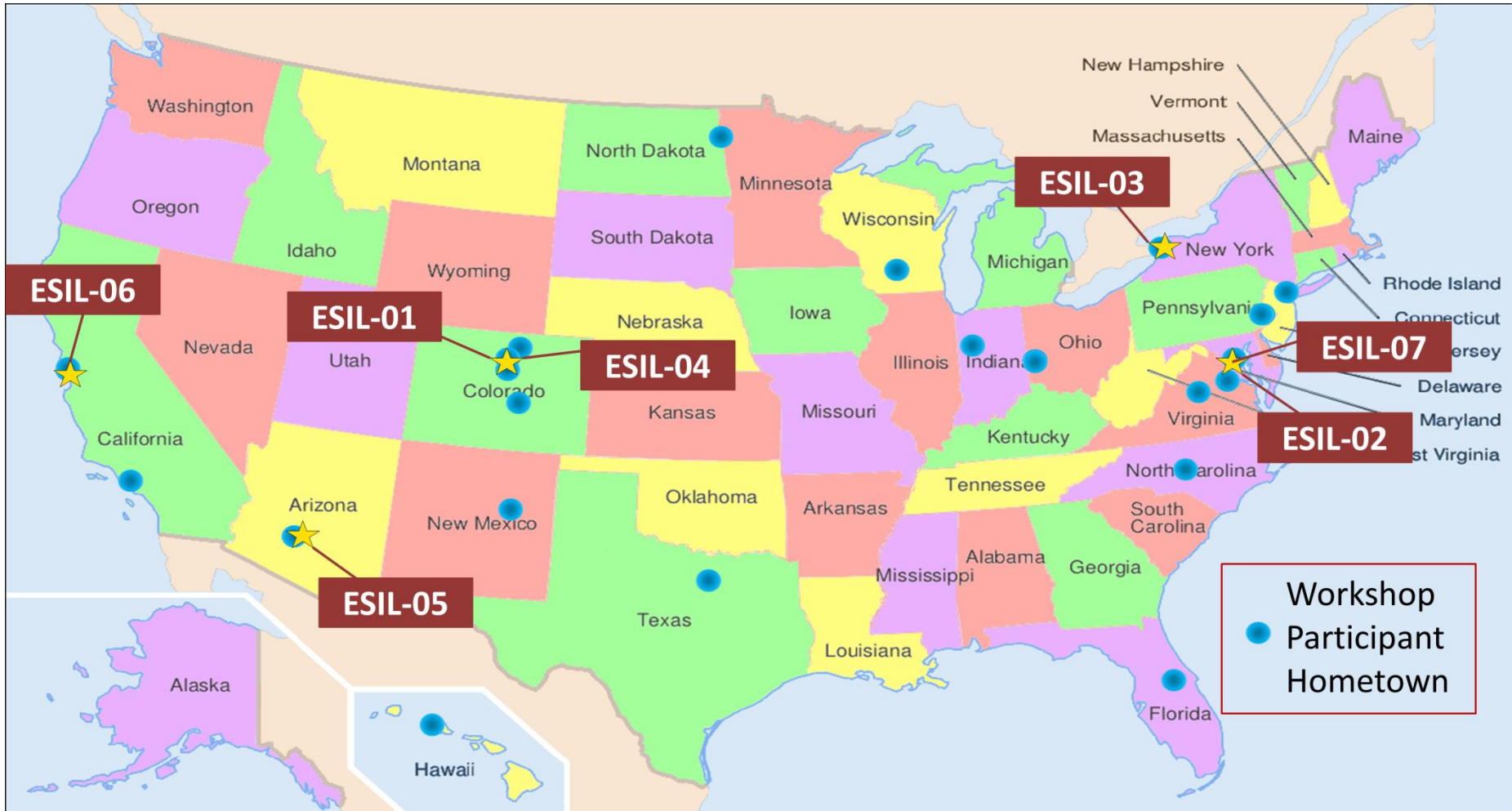


# ESIL-07 – May 2014

- 12 Participants
- Industry focus:
  - Student non-profit strategy
- Guest contributors:
  - Robert Lightfoot – NASA
  - George Nield – FAA
  - David Brandt – LMCO
  - A.C. Charania – Virgin Galactic
  - Charles Miller
  - Mischa Fisher
  - Carissa Christensen -Tauri Group
  - Richard Dalbello - OSTP
  - Lori Garver - ALPA



# Impact





# Support Other Events

- SpaceVision Conference (2011, 2012, 2014)
  - Logistics/planning/speaker support
- Space Generation Fusion Forum (2012, 2013, 2014)
  - Logistics/planning/speaker support
  - Video recording support
  - Badge lanyards

# Publications/Presentations

- Bandla, Sirisha, Bradley Cheetham, Rachel Hakeem, and Luis Zea, **Applying Insights of Game Theory to the Microgravity Utilization Market**, 65<sup>th</sup> International Astronautical Congress, Toronto Canada, IAC-14,E6,3,3,x24346
- Henwood, Brienna, Nathan Wong, John Stark, Ken Davidian, Bradley Cheetham, Kaizad Raimalwala, Matt Cannella, Liz Kennick, Sirisha Bandla, Jules Feldhacker, and Jim Crowell, **“The ‘Game’ of Training Humans for Commercial Suborbital Spaceflight,”** 64<sup>th</sup> International Astronautical Congress, Beijing China, IAC-13-E6.2.3
- Cheetham, Bradley, Juliana Feldhacker, Angela Peura, Ashley Chandler, Cassie Kloberdanz, and Lewis Groswald, **“Government’s Role in Commercial Space from the Perspective of Emerging Industry Leaders,”** 63<sup>rd</sup> International Astronautical Congress, Naples Italy, IAC-12-E6.4-D4.2.1.

# Next Steps

- To be determined...

# Contact Information

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