

# Education & Science Innovation (ESI) Subcommittee Membership and Study Areas

## Members:

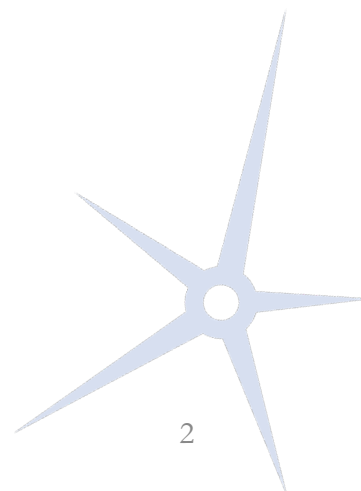
- Jade Morton, Chair
- Terry Moore, 1st Vice-Chair
- Dorota Grejner-Brzezinska, 2nd Vice-Chair
- Penny Axelrad
- Renato Filjar
- James Geringer
- Russ Shields

## Role/ Study Areas:

- STEM & future PNT workforce
- GNSS science applications (space weather, radio occultation, surface reflectometry, natural hazards warning, etc.)

# ESI Subcommittee Proposed Study Areas

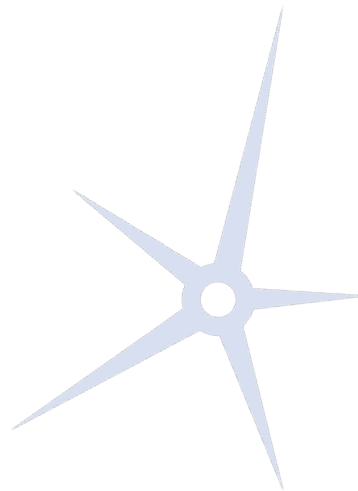
1. US STEM and future PNT workforce education and training; bring in world-wide views into the discussions.
  - Current landscape
  - Recommendations
  - Opportunities
2. Awareness of PNT/GNSS scientific applications



# National PNT Advisory Board – 27<sup>th</sup> Meeting, Nov. 2022

## Finding and/or Recommendation

- **Title of Recommendation:** Invest in the future of US PNT education and training
- **Finding:**
  - China and other countries are gaining on the U.S. or are already ahead in general R&D investment
  - Specifically true for PNT with the emergence of Galileo, Beidou, QZSS, etc.
  - To be competitive, the U.S. needs to expand PNT education.
- **Recommendation:**
  - Need to invest in the future of US PNT education and training
- **Rationale for Recommendation:**
  - Need to expand GNSS Curriculum at US universities.
  - Promote and expand Industry-University partnership
  - Benefit from international partnership
- **Consequences of No Action on the Recommendation:**
  - The US PNT skills gap will continue to grow to potentially critical levels



# National PNT Advisory Board – 28<sup>th</sup> Meeting, May 2023

## Finding and/or Recommendation

- PNT Education and Work Force Training:
  - We propose a comprehensive survey/study of the state of, and perceived needs for, PNT research, education and training in the USA and form comparisons with other leading countries. Organisations such as the GPS Innovation Alliance, EarthScope, ION, IEEE and AGU could provide platforms/resources to conduct such a survey/study. ESI subcommittee members will reach out to these organisations to build a base of evidence.
  - GPS Innovation Alliance: there is a clear need for the ESI subcommittee to engage with the GIA to share the growing awareness of the education, skills and training issues and to enable a concerted voice for both PNT professionals and academic institutions to help create the next generation work force to meet industry needs.
  - The formation of a university PNT representative body should be encouraged, to allow them to speak with a single unified voice. This could also enable faculty & students from universities, from both PNT and related disciplines, to interact with the PNT industry.
  - Broadening awareness: encourage interdisciplinary education at a national level.
- ICG Committee on GNSS Education

# National PNT Advisory Board – 28<sup>th</sup> Meeting, May 2023

## Finding and/or Recommendation Continued

- Science Innovations:
  - Quantum Technology for PNT
    - UK has funded £50M for Quantum Technologies for PNT
    - NASA awarded a group of universities \$15M to develop quantum sensors
  - PNT and AI
    - Smart sensors, RFI, improve PNT precision/accuracy/integrity, GPS operations
    - Science applications
  - Objectives:
    - Information gathering
    - Inform the PNT AB of the latest/future developments on these two cutting-edge fronts.