

# **CGSIC Timing Subcommittee Report**

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*ESA-PB-NAV*

*Victor Zhang and Mike Lombardi*

*NIST Time and Frequency Div.*

# **AREAS BEING SERVED**

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- **Coordinated Universal Time (UTC)**
- **International Timing Centers**
- **Two-Way Satellite Time Transfer (TWSTFT)**
- **Two-Way Optical Fiber Time Transfer (TWOFTFT)**
- **Global Navigation Satellite Systems**
- **Telecommunications Industries**
- **Power Grids and other Industries**
- **As Research and Comparison Tool**
- **Other**

## 55th CGSIC Meeting - Timing Subcommittee

*Tampa, Florida, 14 September 2015*

*9:00 a.m. - 12:30 p.m.*

**Chair: Włodzimierz Lewandowski, ESA PB-Nav**

**Co-Chair: Victor Zhang, NIST**

- 9:00 Introduction** – *Włodzimierz Lewandowski, ESA PB-Nav*
- 9:10 Report from NIST** – *Victor Zhang, NIST*
- 9:30 Report from USNO** – *Stephen Mitchell, USNO*
- 10:00 Report from APL** – *Mihran Miranian, The Johns Hopkins University  
Applied Physics Laboratory (APL)*
- 10:20 Coffee Break**
- 10:40 Delivering NIST Time to Financial Markets via Common-View GPS  
Measurements** – *Mike Lombardi, NIST*
- 11:00 Status of ELORAN demonstration** – *Ed Powers, Stephen Mitchell, USNO*
- 11:20 A Common Clock Reference For All GNSS – an update**  
– *Tom Stansell, Stansell Consulting*
- 11:40 Time and Navigation Exhibition at the Smithsonian: Progress Report**  
– *Carlene Stephens, Andrew Johnston, National Museum of American History*
- 12:00 Discussion**
- 12:30 Session End**

# New Development

- **Rapid UTC (UTCr) since July, 2013**
  - ❑ Weekly access to daily values of [UTCr-UTC(k)]
  - ❑ **Impact of UTCr on GNSS**
    - Better synchronization of GNSS times to UTC, through improved UTC and UTC(k) predictions
- **Fiber optic time transfer**
  - ❑ Long-term goal: Compare the optical clocks  $\sim 10^{-18}$  @day
  - ❑ More than 14 UTC laboratories actively involved
  - ❑ Already operational UTC(AOS)-UTC(PL) by AGH
    - ❑ Immediate Applications in UTC:
      - Validate the BIPM GNSS calibrator with  $u_B \sim 200$  ps
      - Validate the new GNSS and TWSTFT techniques
- **Primary frequency standards for UTC local realization**

# Meetings (past and future)

- ✓ **23rd meeting of the CCTF WG on TWSTFT, BIPM, Sevres, 7-8 September 2015**
  
- ✓ **20<sup>th</sup> meeting of the CCTF  
15 – 18 September 2015**
  - ✓ **CCL/CCTF Frequency Standards Working Group**
  - ✓ **TAI WG Meeting of Contributing Laboratories**
  - ✓ **Other WGs**
  
- ✓ **World Radiocommunication Conference, 2-27 November 2015, Geneve**
  
- ✓ **10th Meeting of the International Committee on GNSS (ICG-10)  
1-6 November 2015, Boulder, Colorado**
  - ✓ **GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS**
  
- ✓ **PTTI 2016 and EFTF 2016**

**Thank you  
for your attention!**