International Association of Geodesy

presented by

Richard S. Gross

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, CA 91109–8099, USA

4th Plenary Meeting of the UN-GGIM
Subcommittee on Geodesy

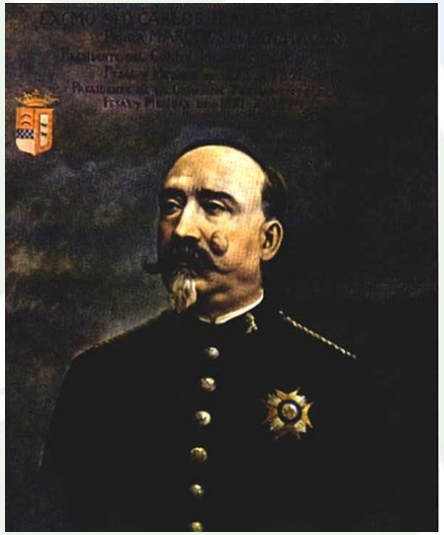
March 18-21, 2024
Bonn, Germany

Jet Propulsion Laboratory
California Institute of Technology

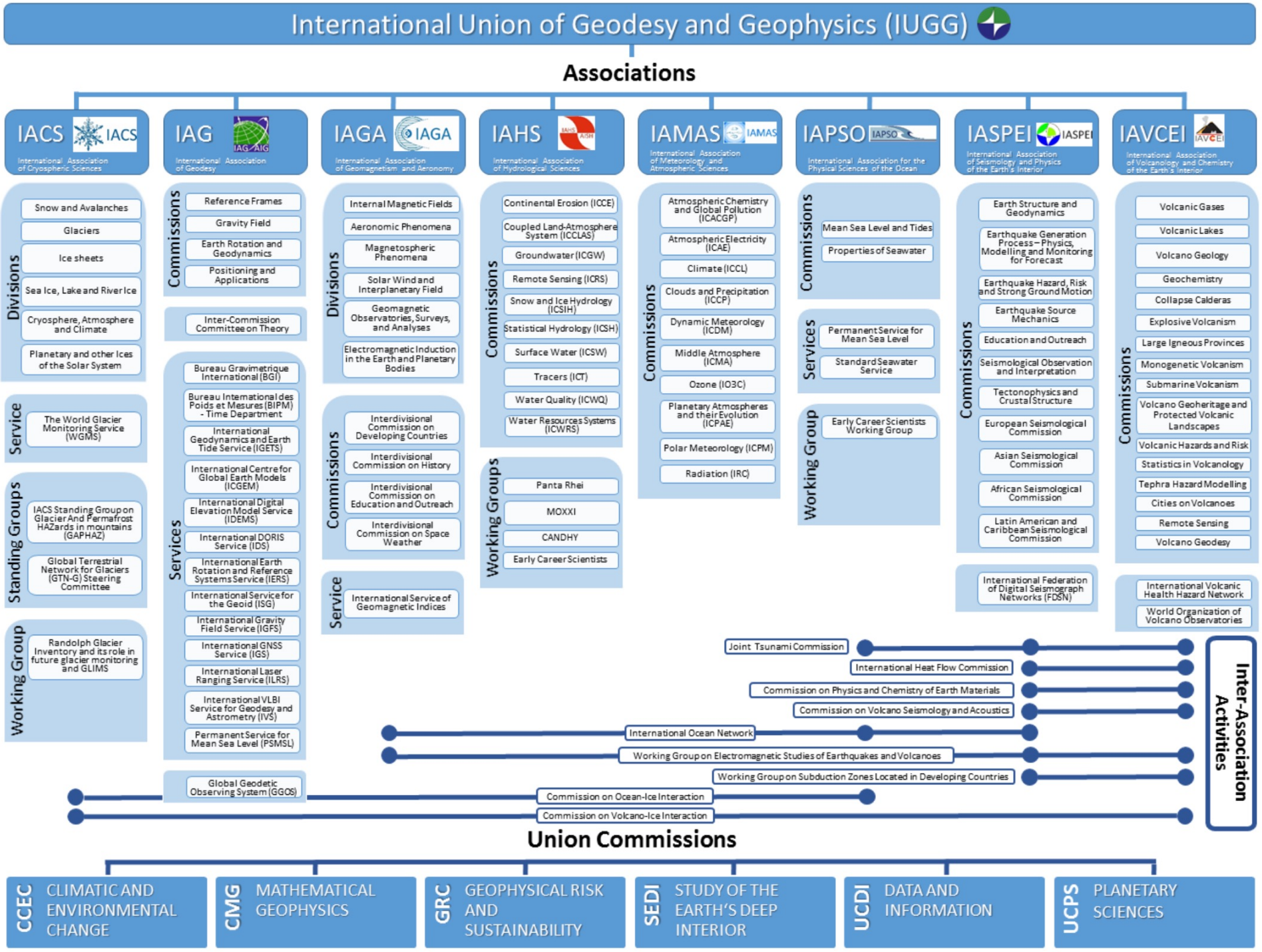
Origins of the IAG

- Central European Arc Measurement
  - Established in 1862
    - By General Johann Jacob Baeyer of Prussia
  - Objective
    - Determine anomalies in Earth's curvature in Central Europe
      - Deflection of vertical; Relative structure of geoid
    - Interpret observed anomalies
      - Structure and composition of Earth
- First Conference of Representatives
  - Held in 1864 in Berlin
  - Created
    - Permanent Commission; Central Bureau; Triennial meetings of General Conferences
  - Considered forerunner of IAG and IUGG General Assemblies
- International Geodetic Association
  - Established at General Conference of 1886 in Berlin
  - First President: General Carlos Ibáñez de Ibero
    - First Director General of Instituto Geográfico Nacional (IGN) Spain
  - Incorporated into International Union of Geodesy and Geophysics
    - Established in 1919 by International Research Council

General Johann Jacob Baeyer

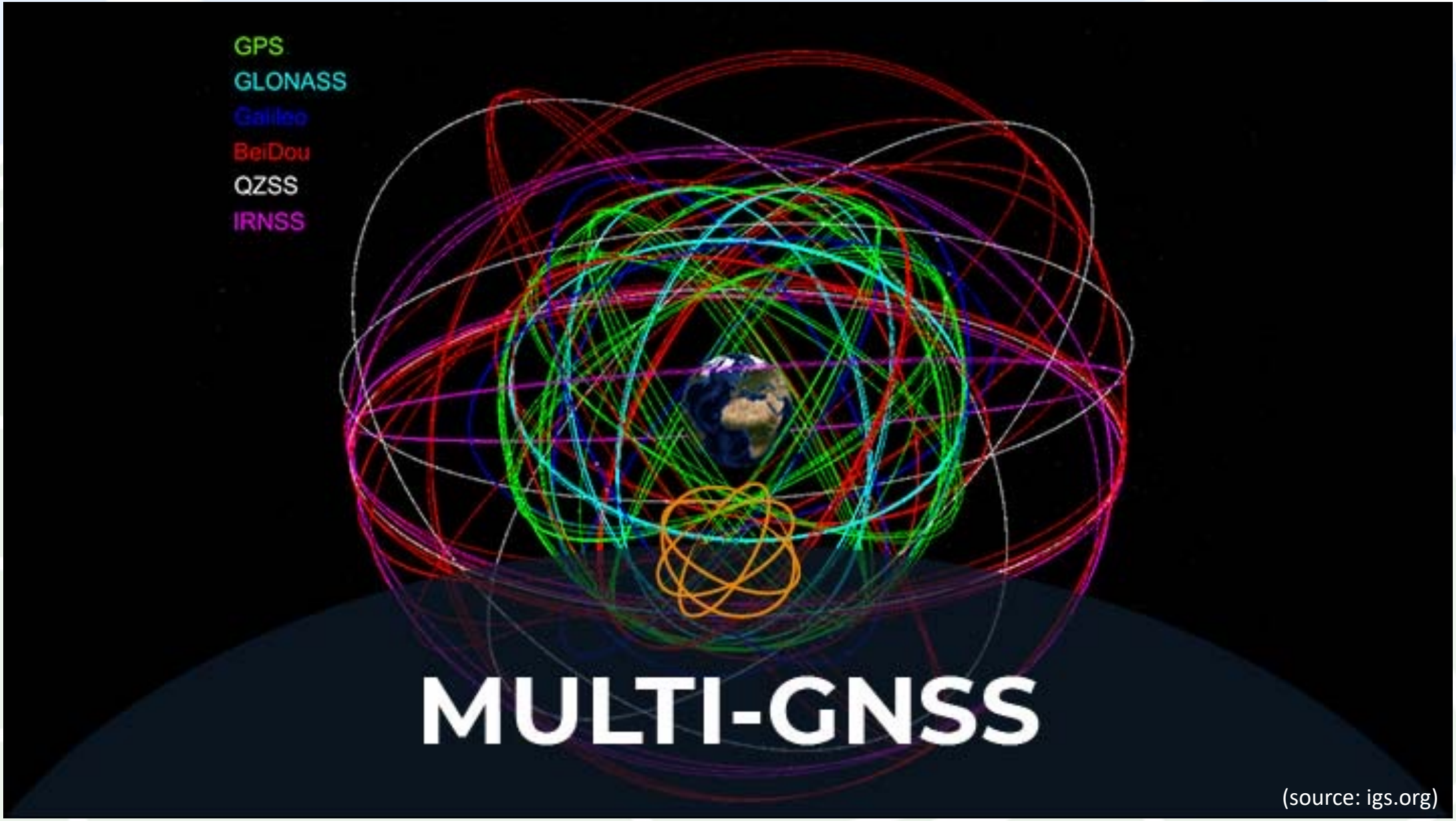


General Carlos Ibáñez de Ibero



Source: iugg.org

International GNSS Service

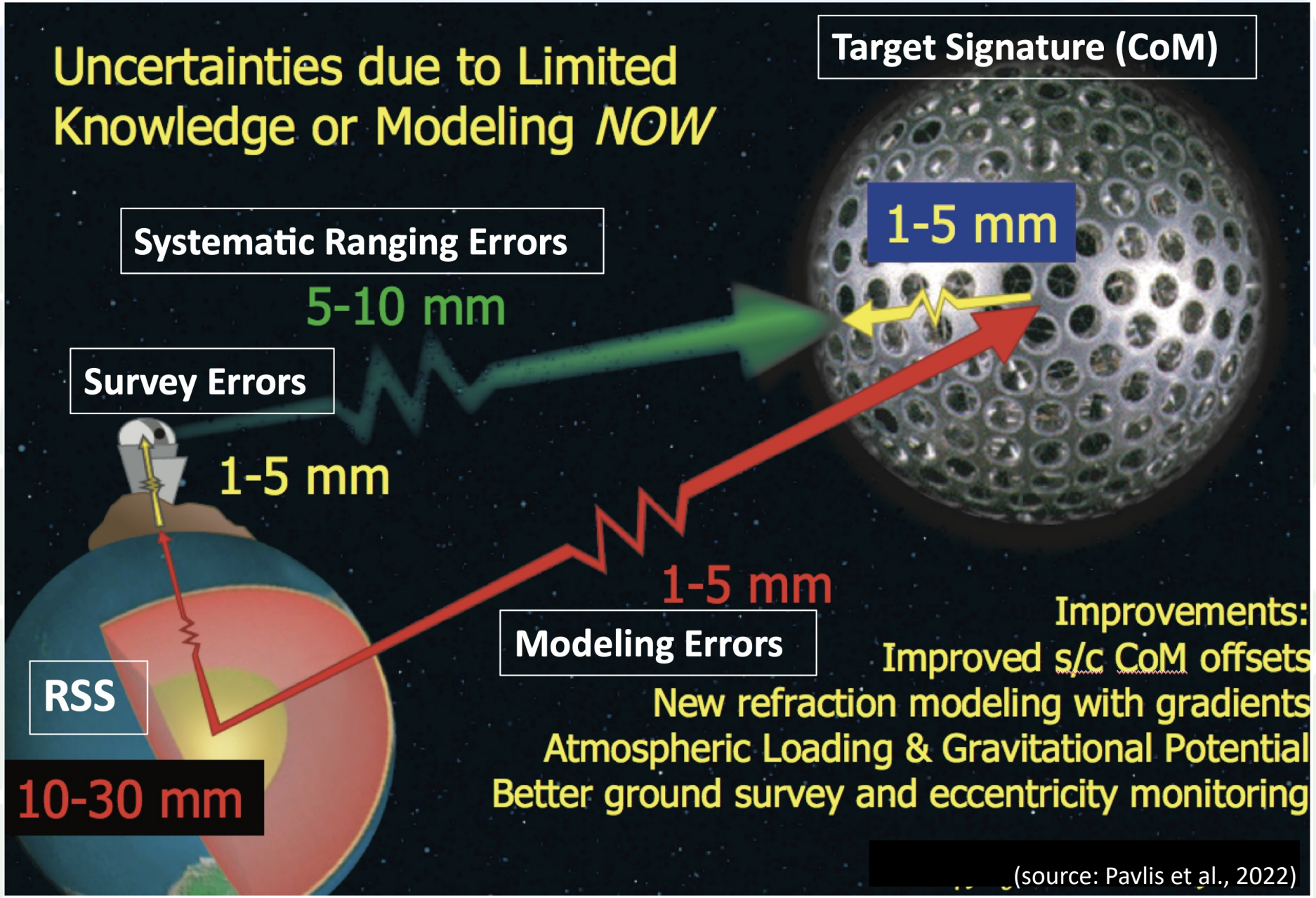


(source: igs.org)

International VLBI Service for Geodesy and Astrometry

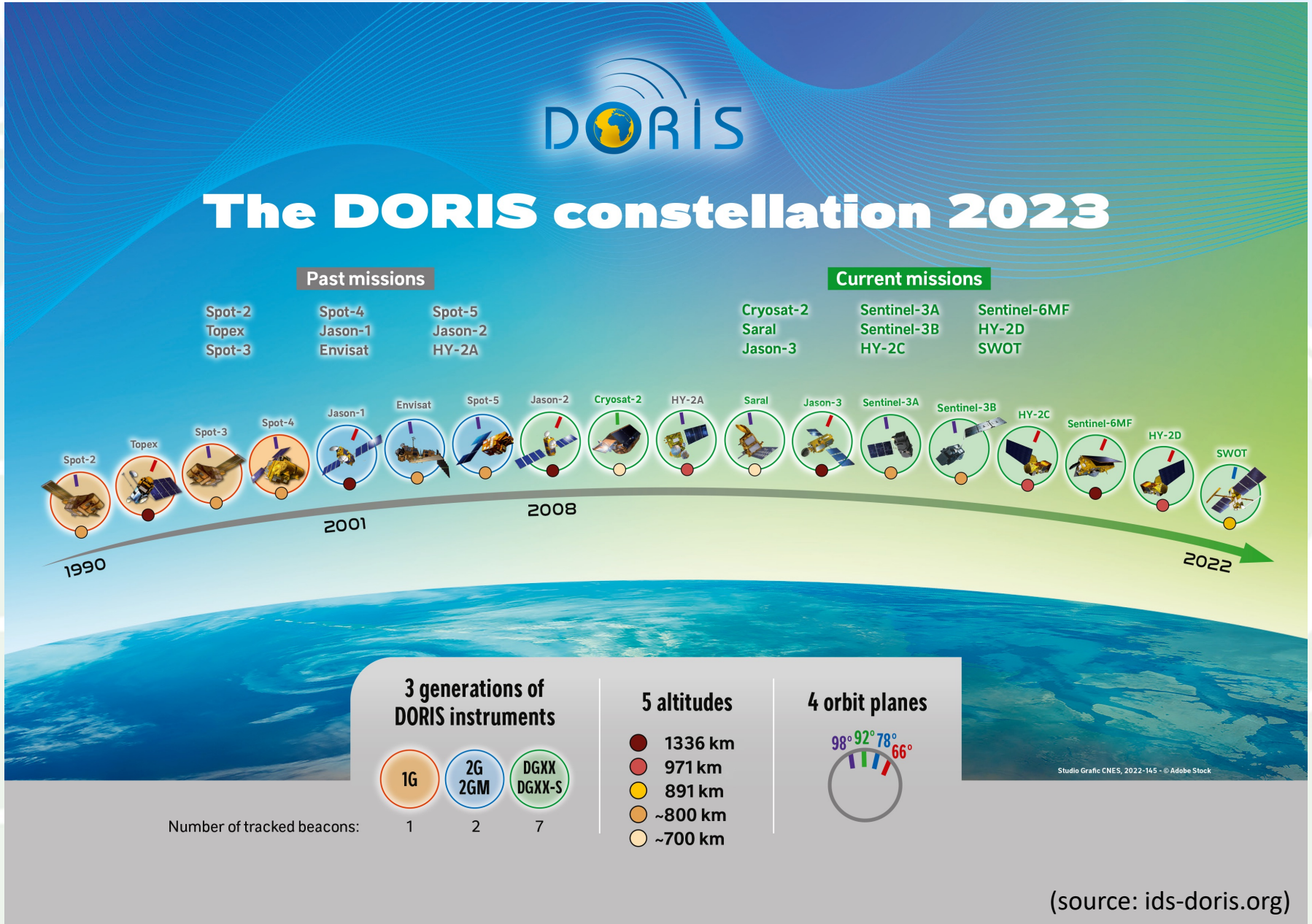
(source: Haas, 2023)

International Laser Ranging Service



(source: Pavlis et al., 2022)

International DORIS Service



(source: ids-doris.org)

International Earth Rotation and Reference Systems Service

- Annual updates to ITRFs
  - Will reduce errors between ITRF realizations
    - Extrapolation errors grow after epoch of last measurement
    - Future positions of stations not always predictable (equipment changes, earthquakes)
    - Services update their own realizations of the ITRF more often than the ITRF itself is updated
  - Will allow stability of frame parameters (geocenter, scale) to be more closely monitored
- First update to ITRF2020
  - Will use updated solutions from the Services
  - Will preserve frame of ITRF2020
  - Will be available late summer 2024

Global Geodetic Observing System

(source: ggos.org)

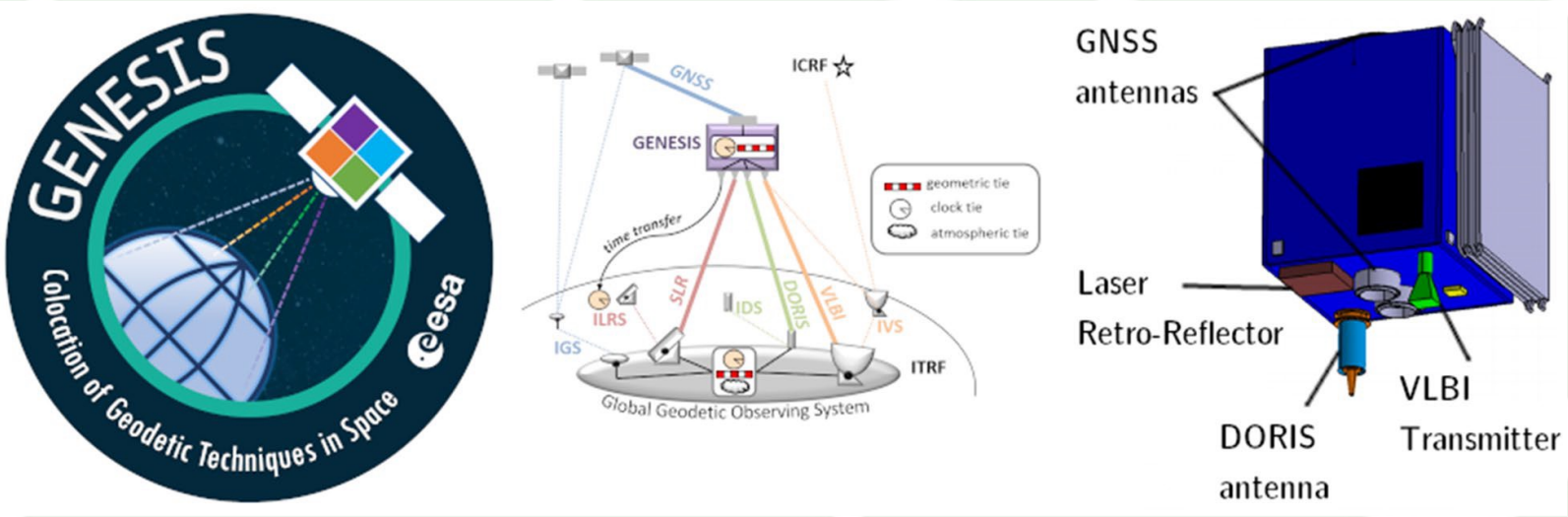
International Association of Geodesy Organizational Structure

- 4 Commissions
- 3 Inter-Commission Committees
- 1 Project
- Global Geodetic Observing System
- 12 Services
- Communication & Outreach Branch

- Council
- Executive Committee
- Bureau
  - President
  - Vice President
  - Secretary General

Joint Working Group on GENESIS

- Joint between IAG Commission 1 (Reference Frames) and IERS
  - Objectives of Joint Working Group:
    - Explore array of scientific opportunities presented by GENESIS,
    - Formulate optimal observing strategies,
    - Develop methodology for consistent integration of GENESIS data into future ITRF realizations with simulations and considering already existing space ties
  - Chair: Johannes Böhm, Austria
  - Members: 37 including representatives of IAG Services, space agencies, geodetic organizations



(source: Delva et al., 2023)

(source: esa.int)