



Global Geodetic Observing System (GGOS) Overview

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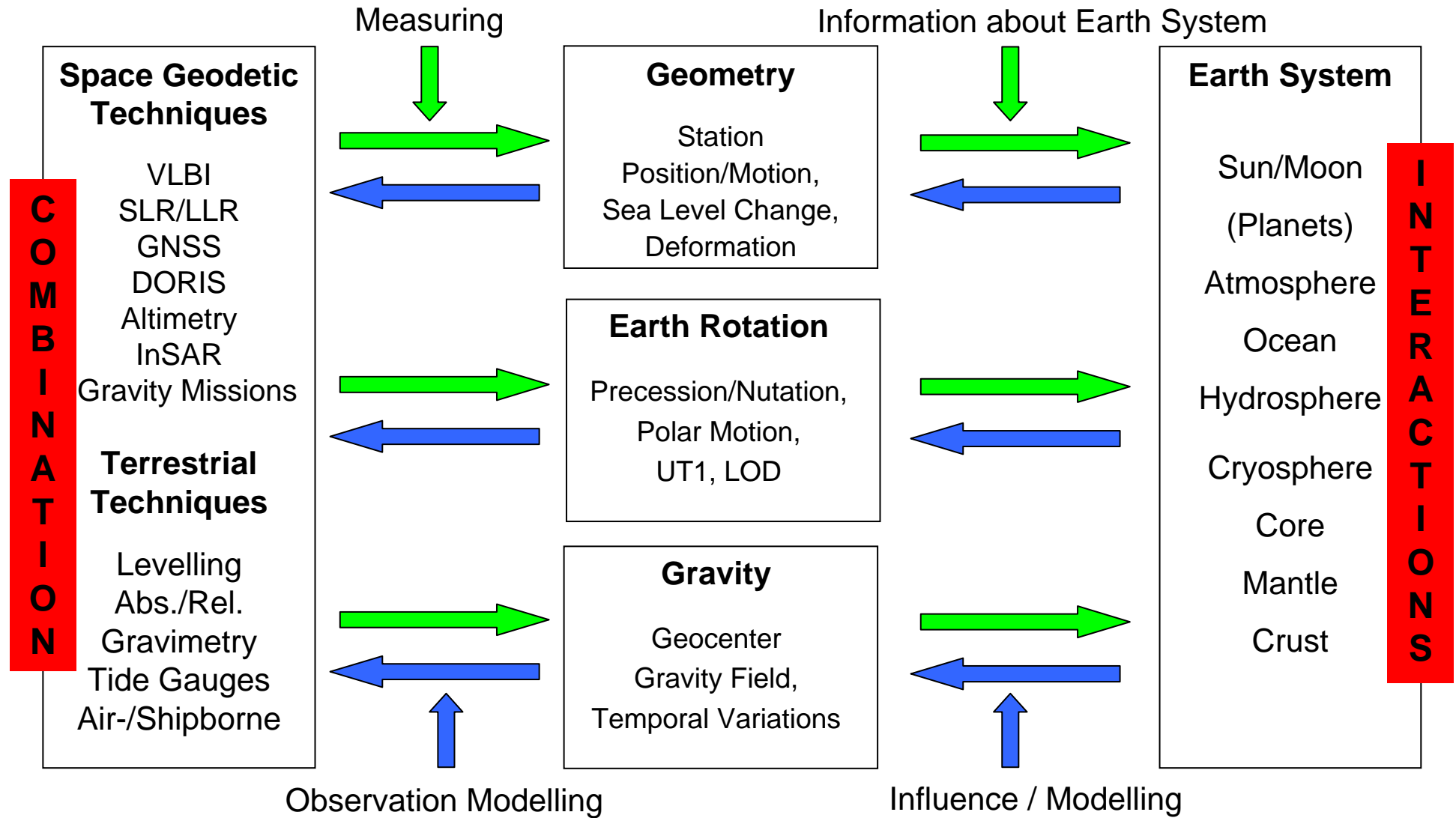
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International Committee of GNSS

UNOOSA - Vienna

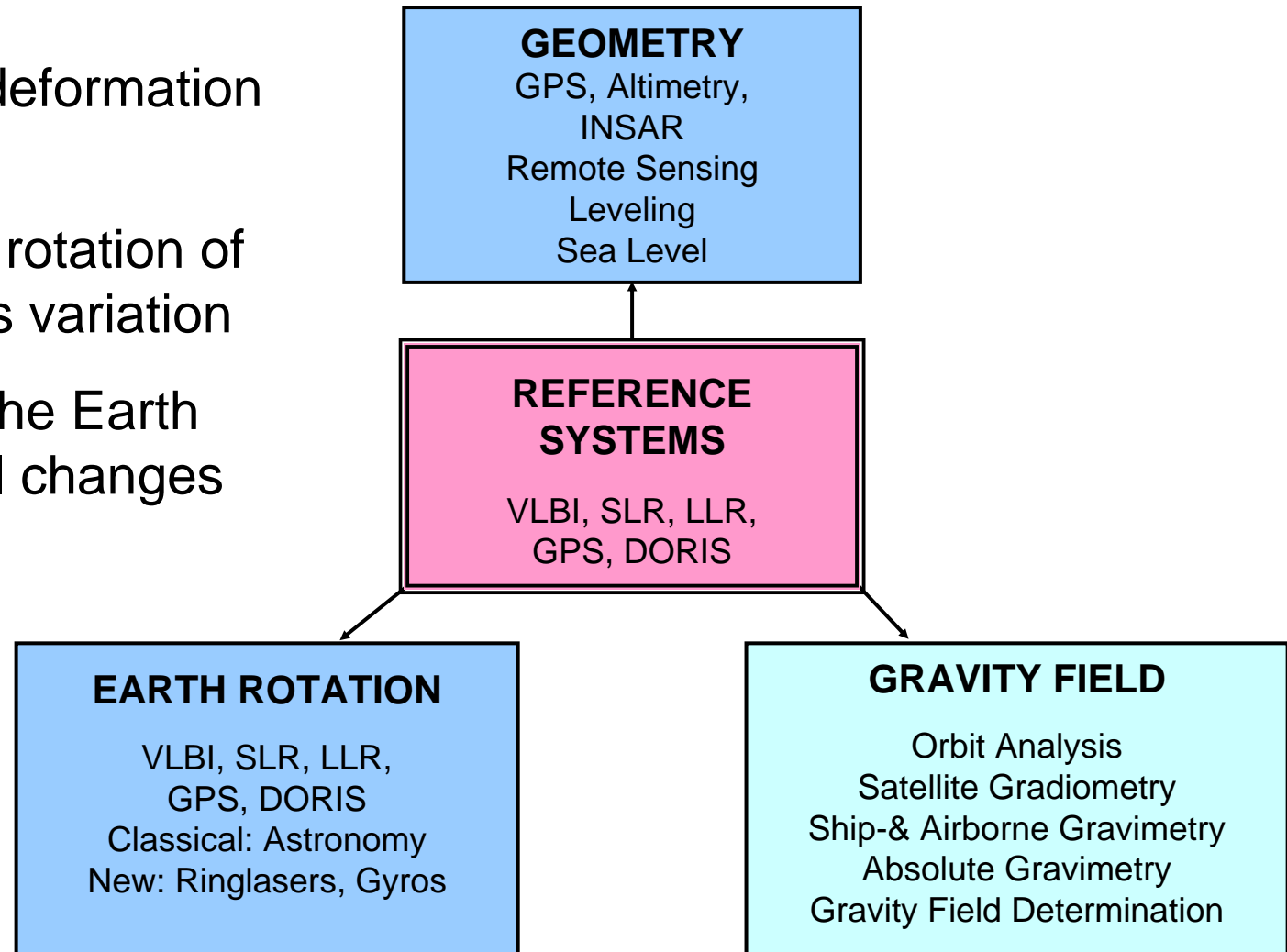
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Measuring and Modeling the Earth's System



Three Pillars of Geodesy

1. Geometry and deformation of the Earth
2. Orientation and rotation of the Earth and its variation
3. Gravity field of the Earth and its temporal changes



Goals of GGOS

- Collect, archive and ensure the accessibility of geodetic observations and models through the IAG Services;
- Ensure the robustness of the three fundamental fields of geodesy: **geometry, orientation, and gravity**;
- Identify a **consistent set of products** and establish requirements concerning its **accuracy** and **reliability**;
- Identify IAG service **gaps** and to close them; to stimulate close **cooperation** between IAG services;
- Promote and improve the **visibility** of the scientific research in geodesy;
- Achieve **maximum benefit** for the scientific community and society in general
- Become the **collective voice** of IAG

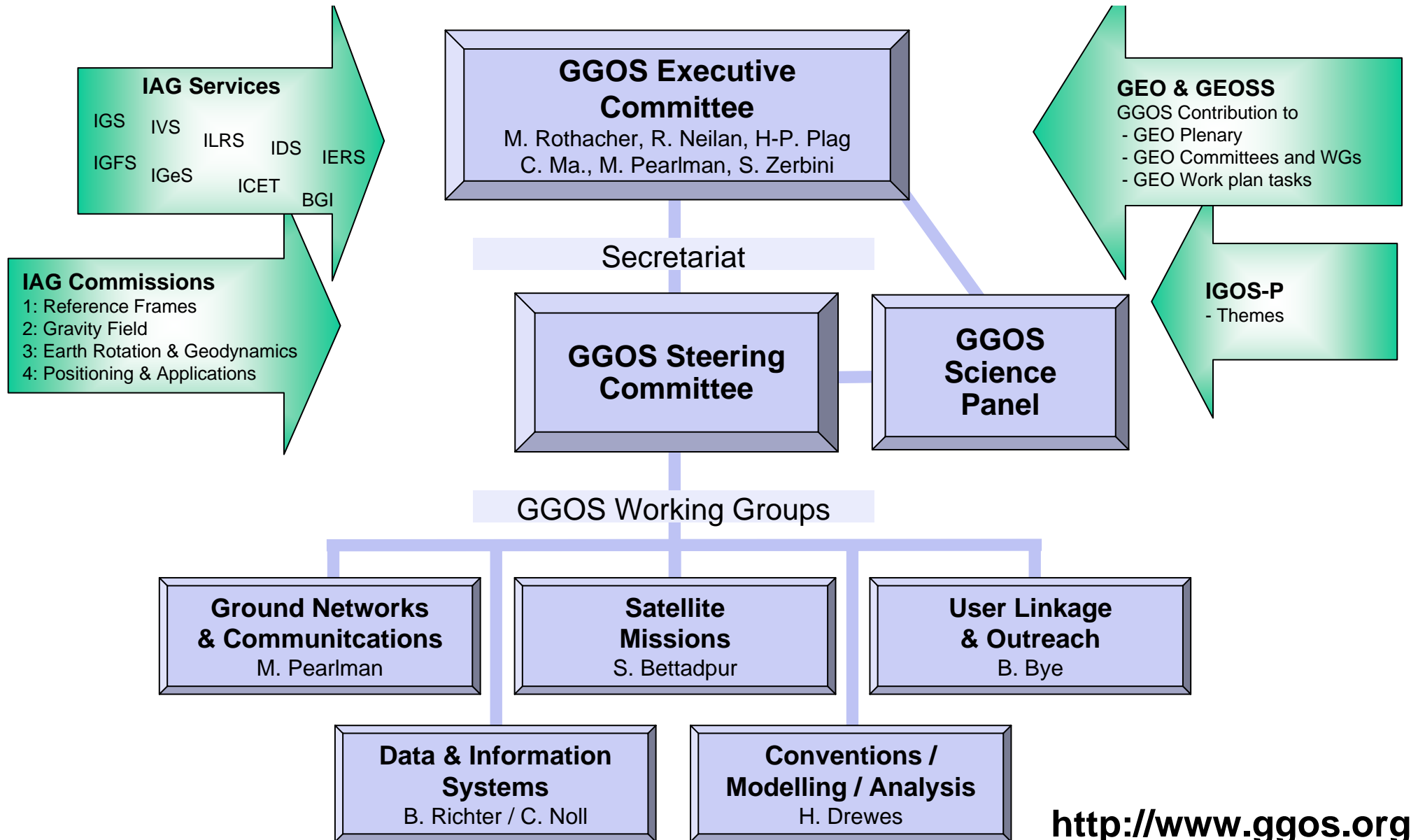
<http://www.ggos.org>

Current Status of GGOS

- GGOS recognized as full member of the Integrated Global Observing Strategy Partnership (IGOS-P) within UNESCO in early 2006 - 4th Global Observing System G_OS:
 - GOOS Ocean, GCOS Climate, GTOS Topography
- IGOS-P accepts GGOS's ***Earth System Dynamics*** theme
 - Geodetic quantities are relevant for several themes and benefit areas
 - Dynamic processes are a cross-cutting issue
 - Design the geodetic and geophysical observing system with this focus
- GGOS on behalf of IAG participates in Group on Earth Observation (**GEO**) and the Group of Earth Observation System of Systems (**GEOSS**)
- Efforts to incorporate the importance of the **reference system and frame** in all aspects of GEOSS
 - GGOS Steering Committee includes our representatives to the GEO working groups:
 - Users Requirements
 - Data and Information
 - Architecture
 - Science and Technology

<http://geodesy.unr.edu/ggos/>

Global Geodetic Observing System (GGOS)



<http://www.ggos.org>

IAG Services: Backbone of GGOS

Global Geodetic Observing System (GGOS)

Geometry

IERS

IGS

IVS

ILRS

IDS

Gravity

IGFS

BGI

IGeS

ICET

ICGEM

GGP

Sea Level

PSMSL

IAS

Others

BIPM

IBS

Key GNSS Contributions

- **Global high-precision reference frame** as the basis for all Earth observations; has to be stable over decades (geocenter as origin, scale, ...)
- Importance as the measurements for understanding **global change** and natural phenomena: earthquakes, strain, volcanoes, etc.
- Observations relevant for understanding atmosphere, weather, climate, ionosphere, time and frequency,
- Connecting tide gauges to a global reference frame (e.g., sea level rise or land subduction) - recent World Climate Research Program Workshop on Understanding Sea-Level
- Reference frame for the determination of low Earth orbiting (LEO) satellite orbits

Geometry and Deformation of the Earth

- Problem and fascination of measuring the Earth:

Everything is moving !

- Monitoring today mainly by GPS permanent networks

- Examples:

- Plate motions
- Solid Earth tides
(caused by Sun and Moon)
- Earthquakes ...

- Continuous monitoring is absolutely crucial



Global GPS Network

