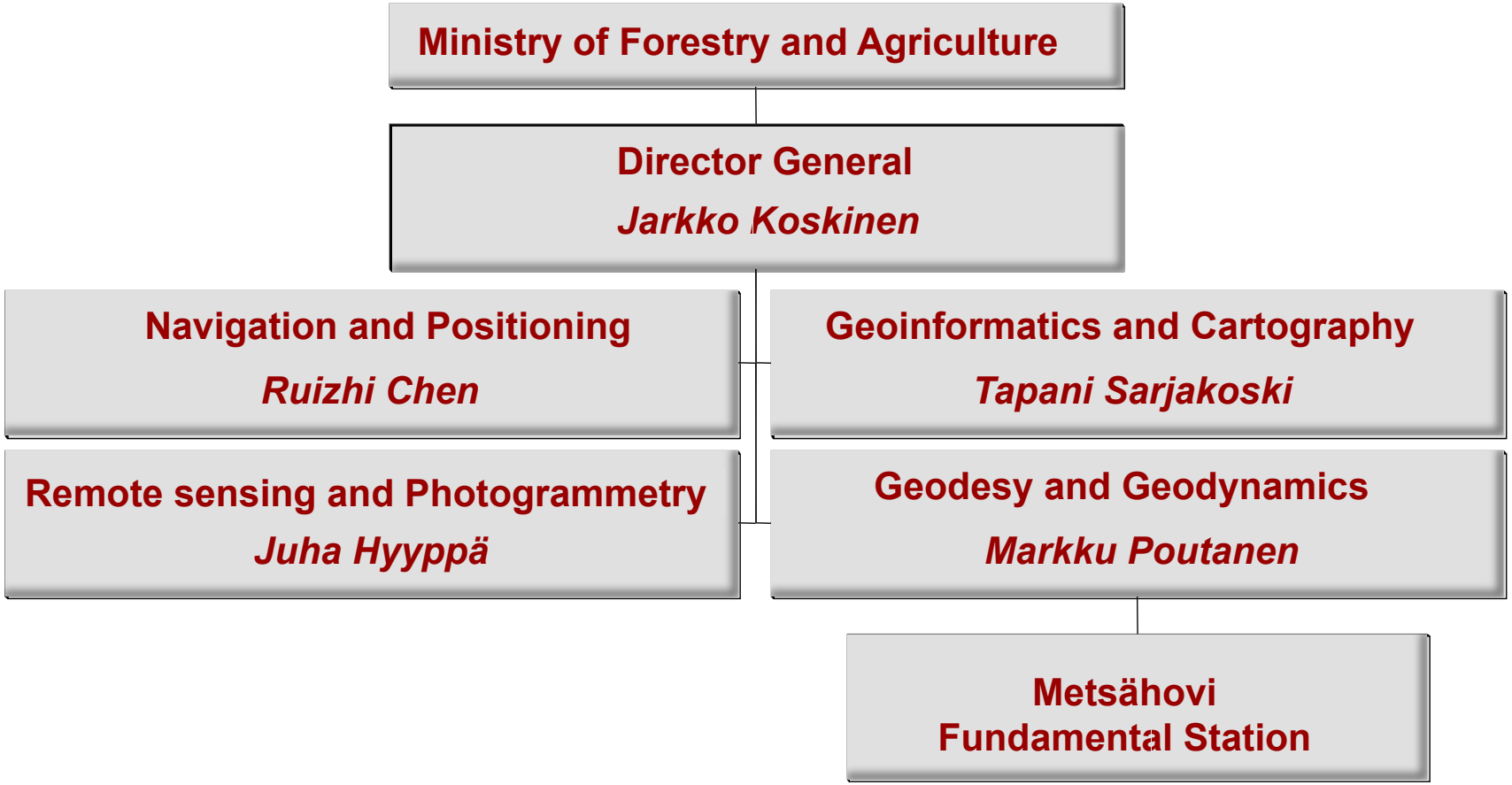
Finnish Geodetic Institute

- Established in 1918
- A governmental research institute under the Ministry of Forestry and Agriculture
- Specialized in geodesy and geospatial information science and technology
- Carries out national and international research and conducts scientific observations in collaboration with academia, public-sector bodies and the geospatial business sector in Finland and elsewhere in Europe
- http://www.fgi.fi

Finnish Geodetic Institute



FINNISH GEODETIC INSTITUTE

History

Established 1918:

- To create national reference frame wich is based on triangulation, astronomical positioning and gravity measurements.
- To compute the geoid model
- To perform research in the field of Geodesy and related Sciences

Tasks during first 50 years:

- First order triangulation, measurements and computation
- National precise levelling, height system
- Baseline measurements, metrology
- Gravity measurements
- Developing methods in levelling and precise distance measurements

FINNISH GEODETIC INSTITUTE

Current status and research stations

- Develops methods aimed at acquiring, processing, disseminating and utilising geospatial data to serve the needs of the information society
- Studies and develops methods and instruments in the field of geodesy, geodynamics, geoinformatics, cartography, remote sensing, photogrammetry, navigation and positioning
- Promotes the adoption of new methods and technologies in geodesy, geoinformatics, remote sensing and navigation
- Acts as an expert and research institute for the Ministry of Agriculture and Forestry.

- Office house in Masala since 1995
- Metsähovi Fundamental Station
- Standard Baseline at Nummela
- Permanent GPS stations (13)
- EGNOS/RIMS station at Virolahti.
- Long water tube tilt meter in Lohja Tytyri mine
- Photogrammetric test/calibration field near Metsähovi

Research areas

- Reference systems
- Changing Earth
- Mobile Geomatics
- Spacial Data Infrastructure

Department of Geodesy and Geodynamics

- Creating and maintaining *nationwide reference systems*, *reference frames* and *gravity network*, *connections to the neighboring countries* and *international networks*.
- *Metsähovi* Fundamental station
- *Metrology*; Nummela Standard Baseline; The National Standards Laboratory (length and *g*)
- *Research work* in the fields of gravimetry, physical geodesy and geodynamics

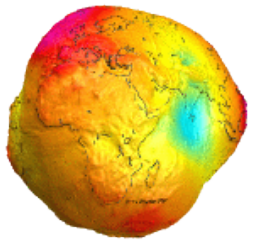
FINNISH GEODETIC INSTITUTE

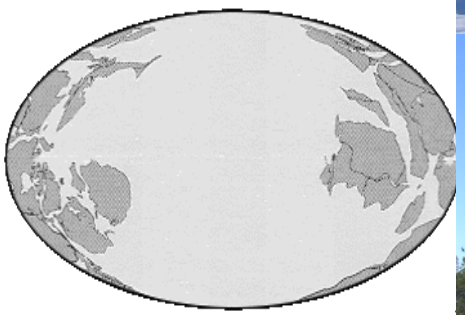
Work and motivation

- Most of the tasks are based on duties mentioned in law and statute of the FGI
- Basic work: Responsibility on the National reference systems
- This implies:
  - nationwide measurements and networks
  - study on geodesy, geodynamics and related topics to understand and model temporal and spatial variations
  - metrology to calibrate instruments, to control errors and guarantee the reliability of the measurements
  - international co-operation

Research areas

- **Coordinates and height**
  - Finnish Reference Frame EUREF-FI
  - Finnish Height System N2000
  - Metsähovi Fundamental Station
- **Gravity**
  - Geoid model FIN2005N00
  - National gravity network
  - Research and measurements abs/rel/SC/satellite
- **Crustal deformations**
  - Postglacial rebound
  - Local deformations
- **Metrology and quality**
  - Baselines, Calibrations
  - National lab. of standards (length, gravity)
  - Quality and reliability of GNSS





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Metsähovi Fundamental Station

1) Satellite laser ranging (SLR), since 1978.
2) Geodetic VLBI since 2004.
3) Geodetic GPS receiver, since 1992 (IGS)
4) Geodetic GLONASS receiver (IGS)
5) Superconducting gravimeter (GGP, ICET) since 1994
6) Absolute gravimeter and fundamental gravity point of Finland
7) A site for absolute gravimeter intercomparison
8) Doris beacon owned by CNES, France (IDS)
9) Photogrammetric test field
10) GPS receiver owned by NASA/JPL, in a real-time NASA tracking network
11) Seismometer owned by the Seismological Institute, University of Helsinki
12) Fundamental point of the new Finnish height system N2000
13) Precise levelling test field
14) Pillar network for local ties and EDM (electronic distance measurement) tests
15) A soil moisture tracking network
16) Weather stations
17) A 60-m deep borehole, previously used for a borehole tiltmeter

Metsähovi fundamental station

Metsähovi Fundamental Station

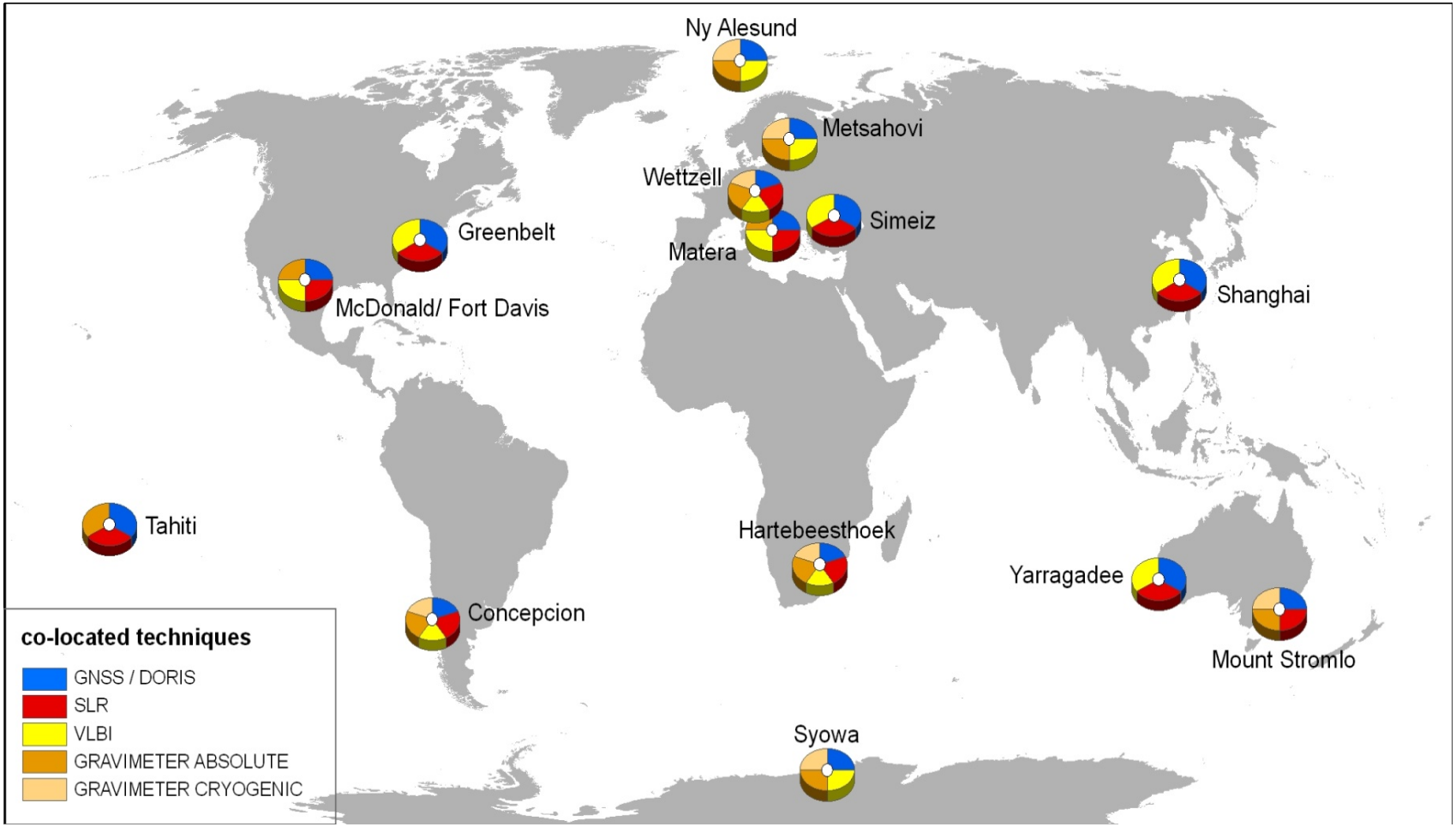

New height system N2000,
basic point established 2007


GPS in global networks since 1991-


Satellite Laser Ranging since 1978-
Geodetic VLBI since 2004-


Superconducting gravimeter since1994-

Geodetic observatories (core sites) used in ITRF2008



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Renewal of Metsähovi

- Ministry of Agriculture and Forestry allocated a total of 8.1 M€ (~10.6 M$) for renewal of Metsähovi during next five years

- SLR (new telescope, new laser,...)
- VLBI (VLBI-2010 compatible new telescope)
- SCG (already ordered)
- Finnish Permanent GNSS Network (~20 receivers, 2012)
- Infrastructure

Renewal of SLR

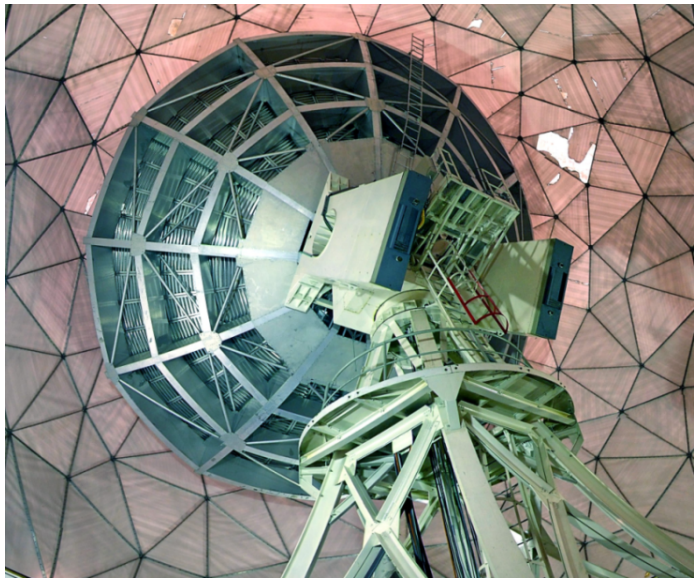
- New SLR system, telescope 60cm-1m
- Fast kHz laser (We already have a HighQ 2 kHz laser)
- Pointing accuracy sufficient for semi-automated operation, also daytime
- New dome
- Renewal 2013-2015 (decision/order 2012)

- Discussion: Co-operation with NASA

Old 1m telescope; planned renovation/modification for second SLR in Metsähovi

Renewal of VLBI

- Current telescope slow for VLBI2010
- Telescope-time limited
- New 2010-compatible telescope
- Renewal 2014-2016 (decision/order 2013)



Current radio telescope (14 m dish) used in geo-VLBI is owned by Aalto University. 6-8 campaigns/year possible. To be replaced by a new telescope