

SCOSTEP-WDS Workshop
NICT, Japan
28 September, 2015

Activity of CODATA on Earth and Space

Alena Rybkina

Member of CODATA EC

Geophysical Center of RAS

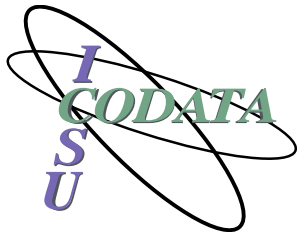
a.rybkina@gcras.ru

Simon Hodson

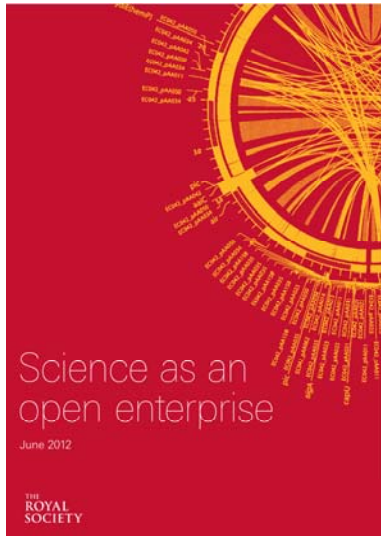
CODATA Executive director

simon@codata.com

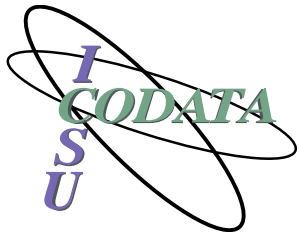




Data Revolution: Challenges and Opportunities



- The digital age has brought a data revolution that presents science with major challenges and opportunities.
- Opportunities because we can gather unprecedented volumes and types of data and analyse them far more quickly.
- **Exploiting these opportunities is the major challenge of international science.**
 - Challenges for data infrastructure, networks and analysis.
 - Fundamental methodological issues for reproducibility and transparency.
 - Challenges and opportunities for science systems, technical and human.
- **Data for research should be intelligently open: accessible, assessible, intelligible, useable.**
- **Creating a world that counts:** Mobilising the Data Revolution for Sustainable Development.
- **GODAN-ODI Report:** improving agriculture, food and nutrition with open data.



CODATA Strategy: Mobilising the Data Revolution



New CODATA President
Geoffrey Boulton, FRS
Chair of *Science as an
Open
Enterprise Report*



Simon Hodson
CODATA Executive
Director

New CODATA Executive
Committee elected at
GA in New Delhi, Nov
2014



Exploiting the data revolution is **the** major priority for international science.

CODATA strategy lays out three priorities and a plan that shows we can **deliver benefits** for members on these priorities.

Promote intelligently open data

- **data policies:** supporting implementation of data principles and practice

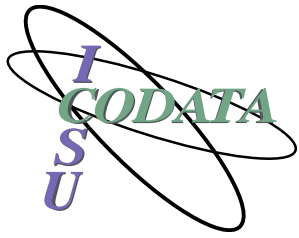
Adapt to the transformation in research

- **data science:** addressing the frontier issues of data science

Promote data skills, data scientists, data managers

- **research data capacity building** (particularly in LMICs)

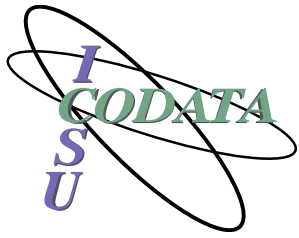




Data Citation: From Principles to Practice

- CODATA Task Group on Data Citation 'Data Citation: From Principles to Practice, A Focus on the Research Policy and Funding Community': <http://www.codata.org/task-groups/data-citation-standards-and-practices>
- Organising an international series of implementation and adoption workshops.
- Promote the implementation of data citation principles in the research policy and funding communities throughout the world.
- Stakeholders include: government, funders, research performing institutions, research administrators, research librarians, researchers, learned societies, publishers, data archives, journal editors ...
 - What is the policy environment for data citation?
 - What are current attitudes to data citation?
 - What infrastructure currently exists to support data citation?
 - What specific plans for implementation were identified?

DC¹
Data Citation Principles



Data Policies

Substantial input to
ICSU Report on
Statement on Open
Access and Metrics
<http://bit.ly/icsu-OA-statement>



Leading role in GEO DSWG
and DMP TF
http://bit.ly/GEO_DSPs



**Implementation of
Data Sharing Principles**
Monday, 13 January 2014, 14:30-18:00
Salle 5+6, Level 3, CICC



CODATA-RDA
Legal Interoperability
Group
[https://rd-
alliance.org/groups/rd-
acodata-legal-
interoperability-ig.html](https://rd-alliance.org/groups/rd-acodata-legal-interoperability-ig.html)



Task Group on Data Citation Principles and Practices

Out of Cite, Out of Mind

http://bit.ly/out_of_cite

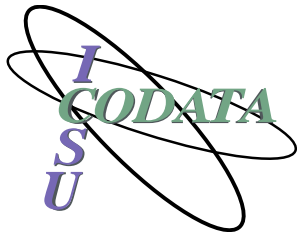
Joint Declaration of Data Citation
Principles:

<https://www.force11.org/datacitation>

Background and Developments:

http://bit.ly/data_citation_principles

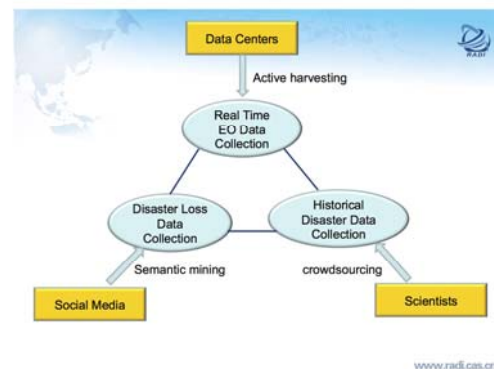
DC¹
Data Citation Principles

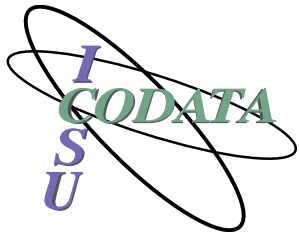


Integrating Geospatial Data on the Web

Coverages and Earth Observation in Linked Data (CEO-LD)

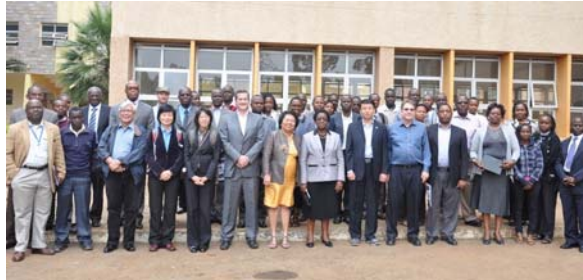
- Funded project led by CODATA.
- UK-China collaboration to implement/validate OGC-W3C standards: <http://www.w3.org/2015/ceo-ld/>
- Builds on collaborations with RAD, Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences and CODATA TG on LOD for Disaster Research.
- Project runs Sept 2015 – May 2016.
- Output will be a draft standard on coverages in Linked Data.





CODATA and Data Science Capacity Building: Training

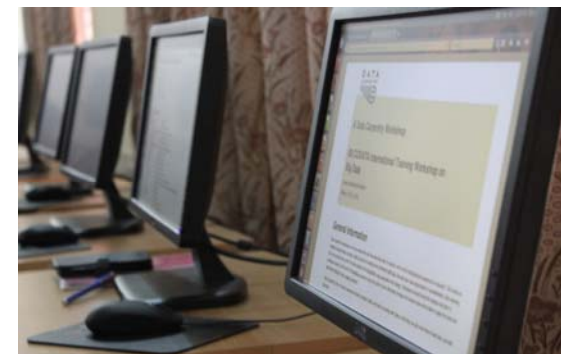
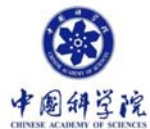
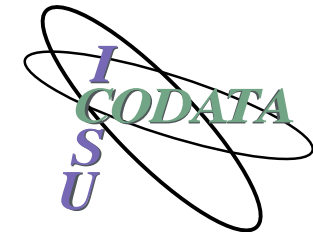
CODATA Training in Big Data
Science
Beijing, 4-20 June 2014
[http://bit.ly/CODATA-
China_Training_2104-Call](http://bit.ly/CODATA-China_Training_2104-Call)

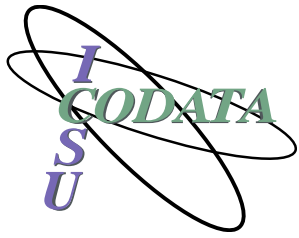


CODATA ISI Workshop on Big
Data, Indian Statistical Institute,
Bangalore, 9-20 March 2015
[http://drtc1.isibang.ac.in/bdwo
rkshop/](http://drtc1.isibang.ac.in/bdworkshop/)



Training Workshop on Open
Data, Kenya, Jomo Kenyatta
University of Science and
Technology, 3-5 August 2014
[http://bit.ly/codata-training-
jkuat](http://bit.ly/codata-training-jkuat)





Research Data Science Summer Schools



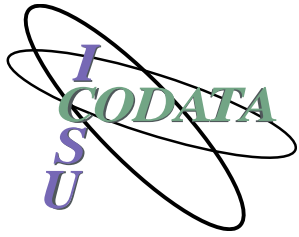
CODATA-RDA Research Data Science Summer Schools will:

- address a recognised need for Research Data Science skills across disciplines;
- follow an accredited curriculum;
- provide a pathway from a broad introductory course for all researchers (Vanilla) through more advanced and specialised courses (Flavours and Toppings);
- be reproducible: all materials will be online with Open licences;
- be scalable: emphasis will be placed on Training New Teachers (TNT) and building sustainable partnerships;
- **pay particular attention to the needs of young researchers in LMICs.**

Microsoft
Research



The Abdus Salam
**International Centre
for Theoretical Physics**



Research Data Science Summer Schools

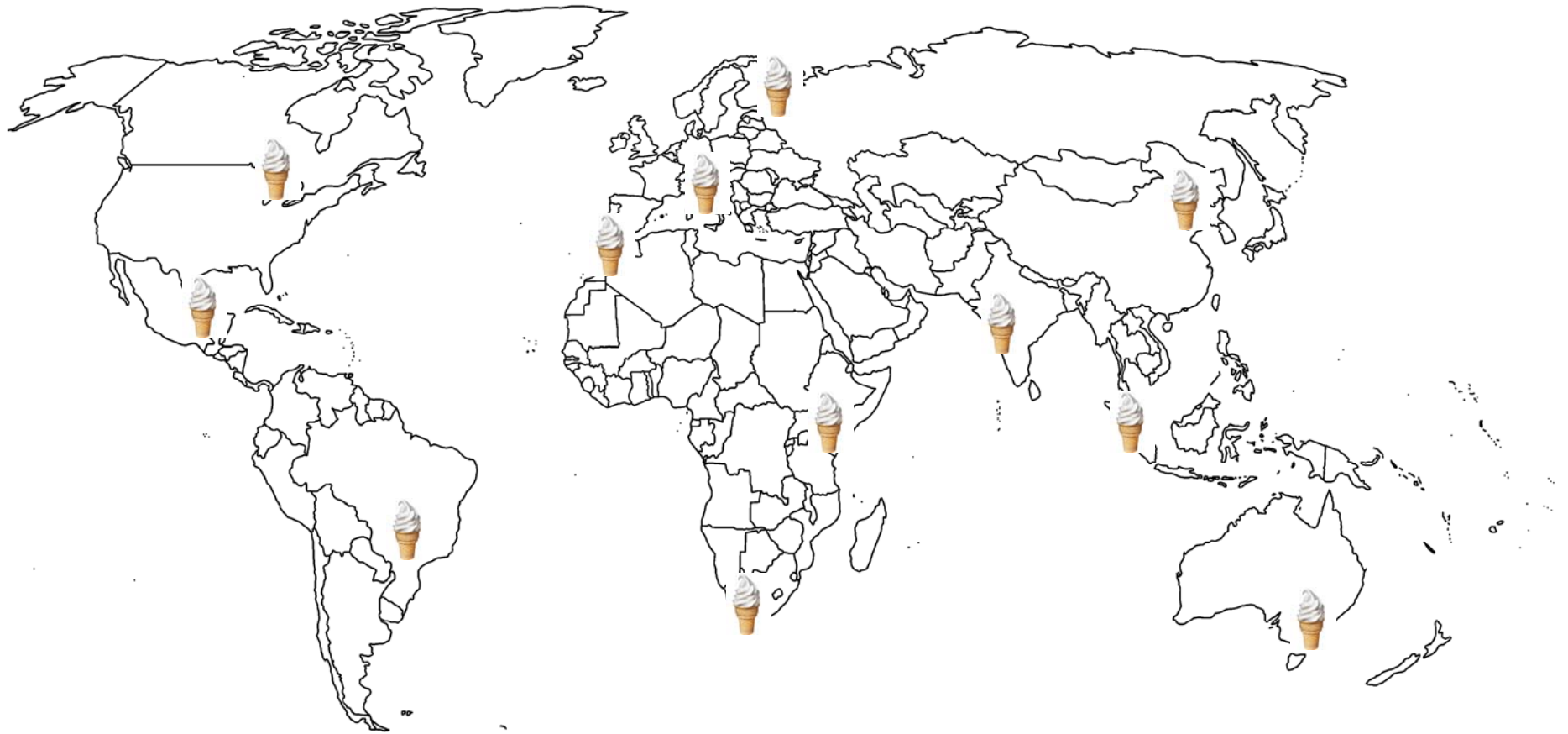


First Vanilla School, 1-12 August, ICTP, Trieste

- ICTP providing accommodation and meals for up to 120 students.
- Total 30K euros funding for student travel committed by ICTP, TWAS and CODATA.
- **Priority for students from LMICs.**
- Other sponsors and funders welcome!
- Explore regional schools with TWAS and ICSU regional offices.



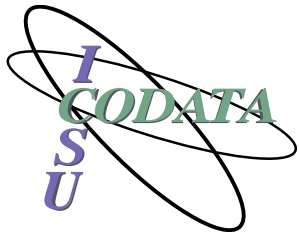
The Abdus Salam
International Centre
for Theoretical Physics



We are designing Vanilla for a world tour!



Italy... then South Africa, Mexico, Brasil, USA, Kenya, India, Australia, China, Russia, Indonesia.



CODATA: Frontiers of Data Science

<http://datascience.codata.org/>

Dedicated to the advancement of data science and its application in policies, practices and management as Open Data to ensure that data are used in the most effective and efficient way in promoting knowledge and learning.



Sarah Callaghan



Relaunched *Data Science Journal*.

- New Editor-in-Chief and Editorial Board.
- New Partnership with Ubiquity Press



SciDataCon 2014
International Conference on
Data Sharing and Integration for Global Sustainability



SciDataCon 2014, 2-5 Nov, New Delhi



Organized by:



**CODATA, RDA and WDS Conference
DC Area, USA, September 2016**



CODATA

International Council for Science : Committee on Data for Science and Technology

Search

Share:

CODATA Task Groups 2014 - 2016

Through its Task Groups, CODATA executes an ambitious international scientific agenda, addressing major data needs and policy issues in a broad range of subjects. These activities are selected at the biennial CODATA General Assemblies.

The following were approved or renewed at the November 2014 General Assembly in New Delhi:

- ➔ **Advancing Informatics for Microbiology**
- ➔ **Anthropometric Data for Special Populations**
- ➔ **Data at Risk**
- ➔ **Data Citation Standards and Practices**
- ➔ **Earth and Space Science Data Interoperability**
- ➔ **Interoperable Data Publications**
- ➔ **Linked Open Data for Global Disaster Risk Research**
- ➔ **Global Roads Data Development**
- ➔ **Preservation of and Access to Scientific and Technical Data in/for/with Developing Countries (PASTD)**
- ➔ **Science and the Management of Physical Objects in the Digital Era**

Tweets

Follow

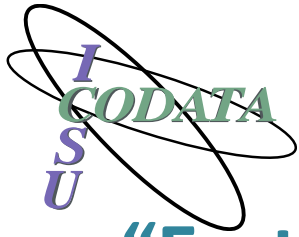
CODATA @CODATANews 19h
#CODATA #isibigdata International Training Workshop
drtc1.isibang.ac.in/bdworkshop
pic.twitter.com/bYxNdlkBV7



CODATA @CODATANews 19h
#CODATA #isibigdata International Training Workshop
drtc1.isibang.ac.in/bdworkshop
pic.twitter.com/ZHZYbvgUmK



Tweet to @CODATANews

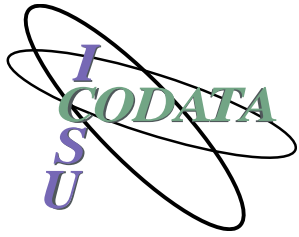


Task Group

“Earth and Space Science Data Interoperability”

List of TG members

<u>Name</u>	<u>Institution</u>	<u>Area of expertise and contribution to Task Group</u>
Jacques Zlotnicki	Observatoire de Physique du Globe de Clermont-Ferrand (OPGC-CNRS)	Volcanology and seismology and geophysical data analysis
Kostiantyn Yefremov	WDC for Geoinformatics and Sustainable Development, National Technical University of Ukraine “Kyiv Polytechnic Institute”	System analysis and data mining
Veenadhari Bhaskara	Indian Institute of Geomagnetism	Geomagnetism
Alexander Soloviev	Institute of Earthquake Prediction Theory and Mathematical Geophysics RAS (IIEPT RAS)	Seismology and data mining
Justin Mabie	National Geophysical Data Center of National Oceanic and Atmospheric Administration (NOAA/NGDC)	Data handling and metadata development
Mioara Manda	Centre National d’Etudes Spatiales (CNES)	International cooperation in geomagnetism
Roman Krasnoperov	Geophysical Center RAS (GC RAS)	GIS applications and geodesy
Masahito Nose	Kyoto University, Kyoto WDC for Geomagnetism	Geomagnetism and space physics
Po Gyu Park	Korean Research Institute of Standards and Science (KRISS)	Electricity and magnetism
Jean Bonnin	Institute of Physics of the Earth of Strasbourg University	Solid Earth studies
Alena Rybkina	Geophysical Center RAS (GC RAS)	GIS applications and modern visualization tools
R.B. Singh	University of Delhi	Remote sensing and GIS for land use
Manuel Pubellier	Ecole Normale Supérieure de Paris / Commission de la Carte Geologique du Monde (CCGM)	Geological and geophysical charts



Objectives of the TG

The TG contributes to development of several scientific products, which are intended for a wide range of researches in geoscience field and related subjects. In this way the TG activities promote multidisciplinary and interoperable data studies. These products include:

- Multi-disciplinary intellectual GIS;
- Inter-regional Geomagnetic Data Center of the Russian-Ukrainian magnetic observatory network;
- New technologies of visualization of various geoscience data including spherical display;
- **Second edition of the comprehensive Atlas of the Earth's Magnetic Field.**

Involving early career scientists is among the principal goals of the TG.

The Atlas of the Earth's Magnetic Field

Editors

A. D. Gvishiani, A. V. Frolov, V. B. Lapshin

The authors

A.A. Soloviev

A.V. Khokhlov

E.A. Jalkovsky

A.E. Berezko

A.Yu. Lebedev

E.P. Kharin

I.P. Shestopalov

M. Manda

V.D. Kuznetsov

T.N. Bondar

J. Mabie

M.V. Nisilevich

V.A. Nechitailenko

A.I. Rybkina

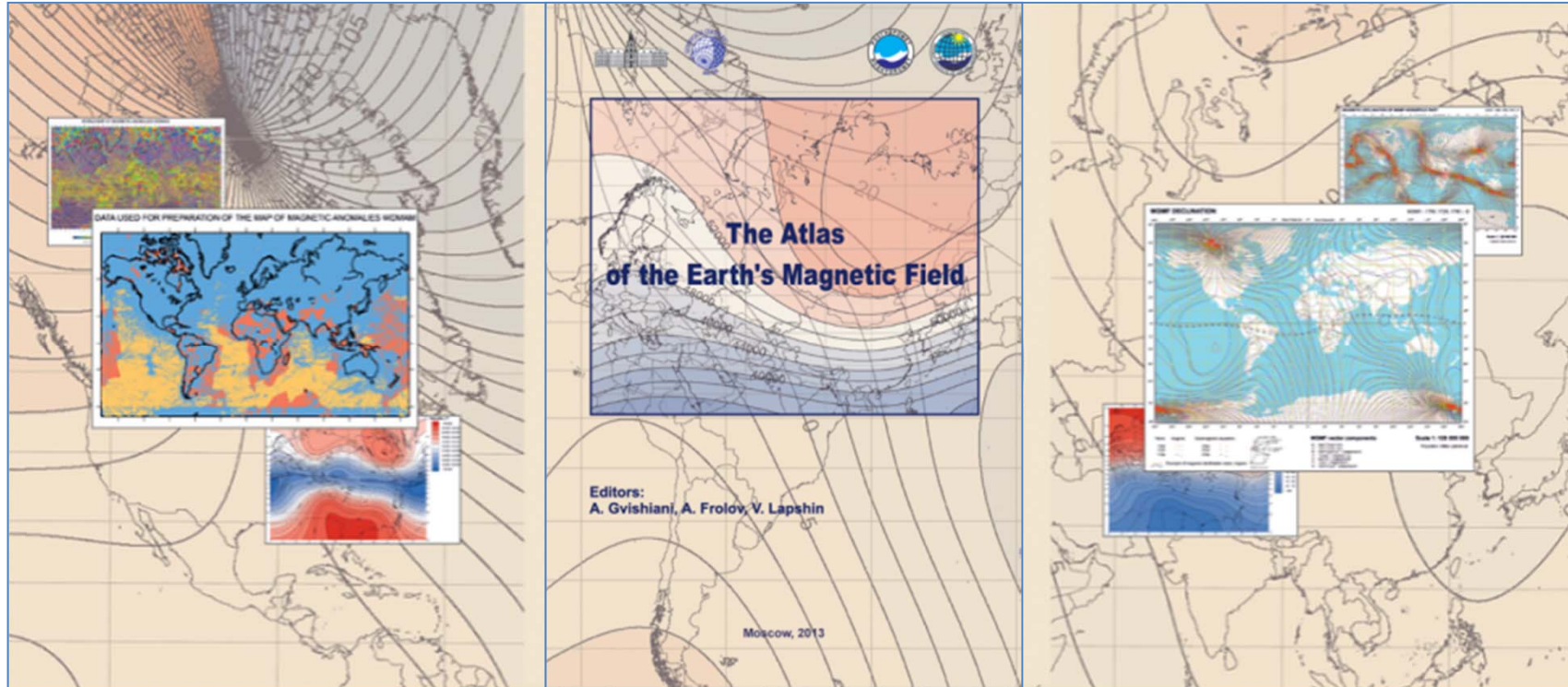
O.O. Pyatygina

A.A. Shibaeva



<http://ebooks.wdcb.ru/doi/atlasmpz.html>

The Atlas of the Earth's Magnetic Field



Chapter 1.

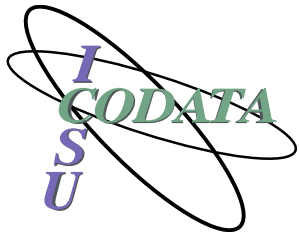
Modern maps of the Earth's Magnetic Field (1500 – 2010)

Chapter 2.

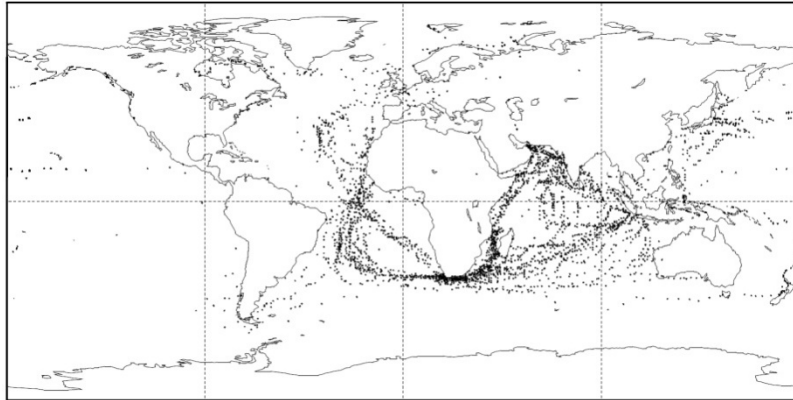
Historical maps of the Earth's Magnetic Field (1600 – 1900)

Chapter 3.

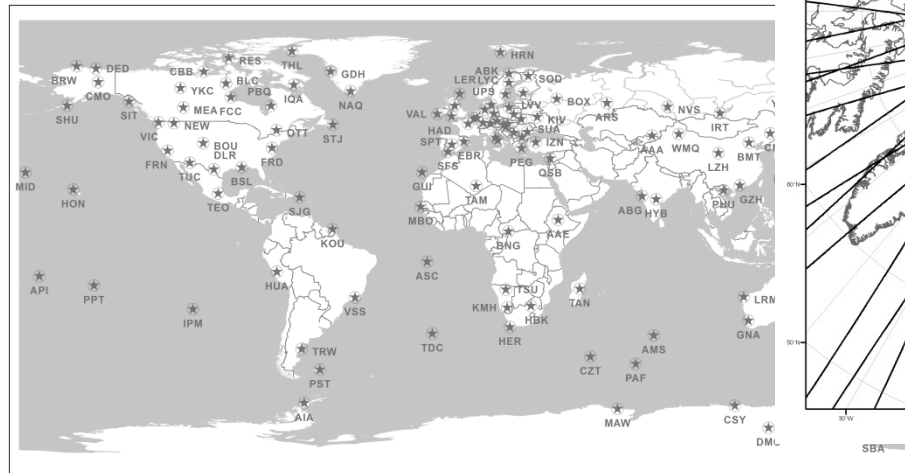
Auxiliary maps



Data sources

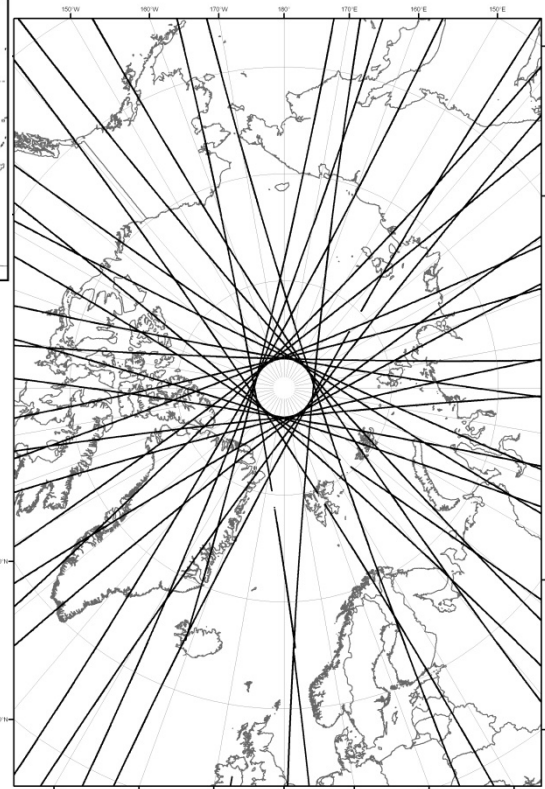


Inclination measurement in the years 1600—1649



INTERMAGNET observatories

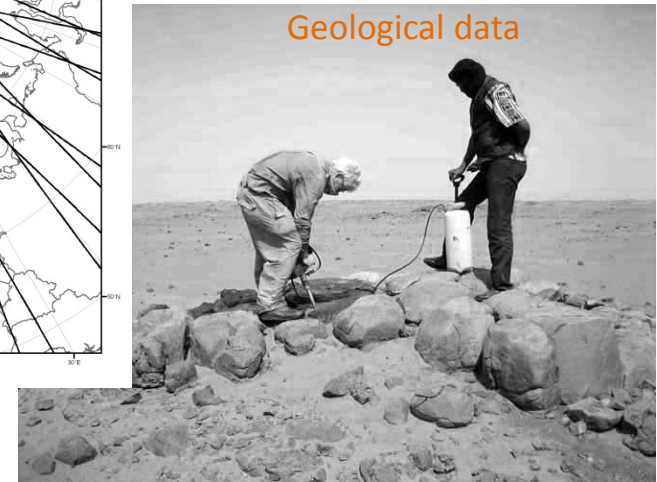
Satellite data

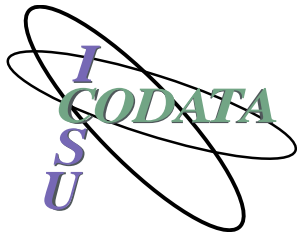


Archeological artefacts



Geological data

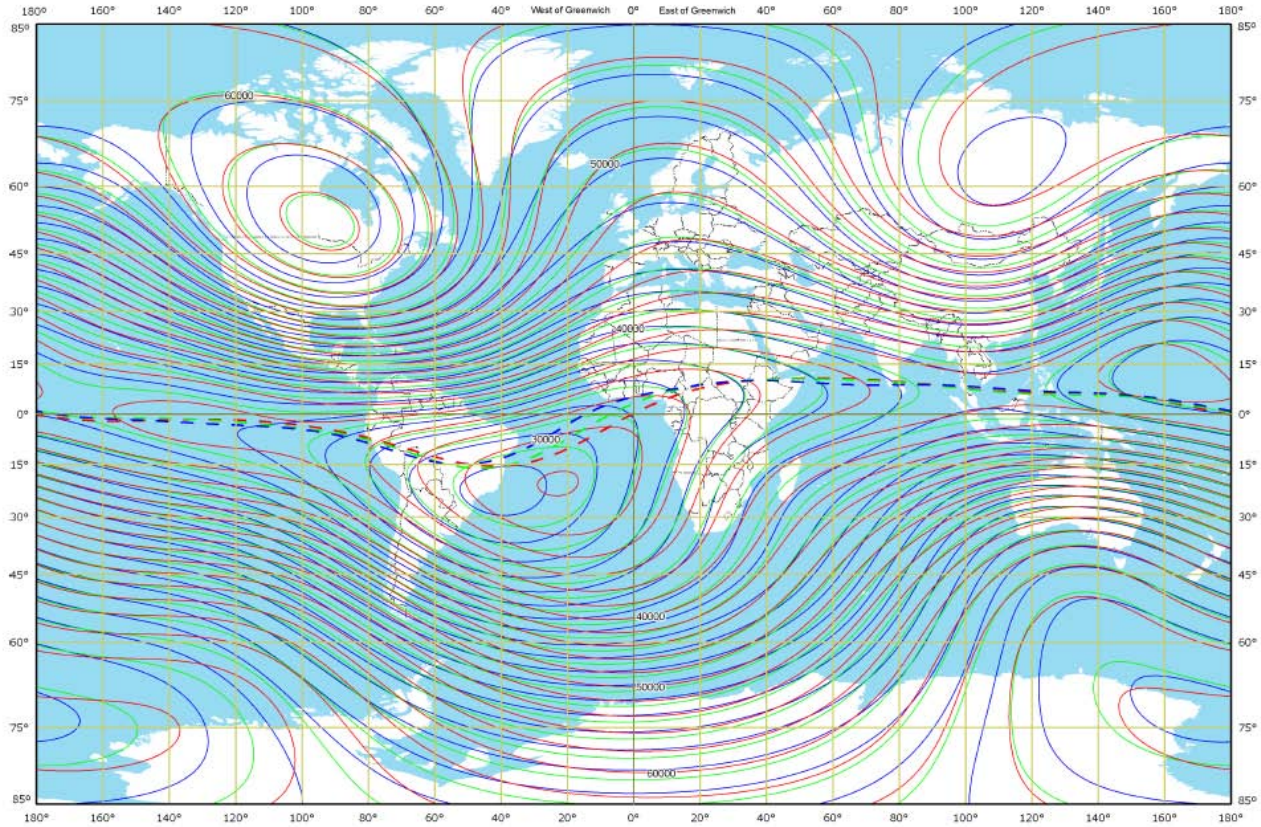




Examples of maps MGMF total intensity

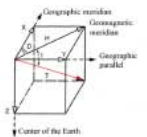
MGMF TOTAL INTENSITY

MGMF – 1850, 1875, 1900 – FM (T)



Years	Isolines	Geomagnetic equators
1850		1850
1875		1875
1900		1900

Example of magnetic total intensity value, nT



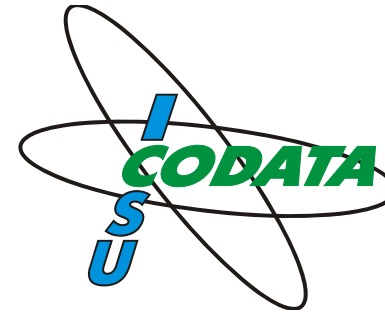
MGMF vector components

- D Declination
- I Inclination
- H Horizontal component
- T Total intensity
- X North component
- Y East component
- Z Vertical component

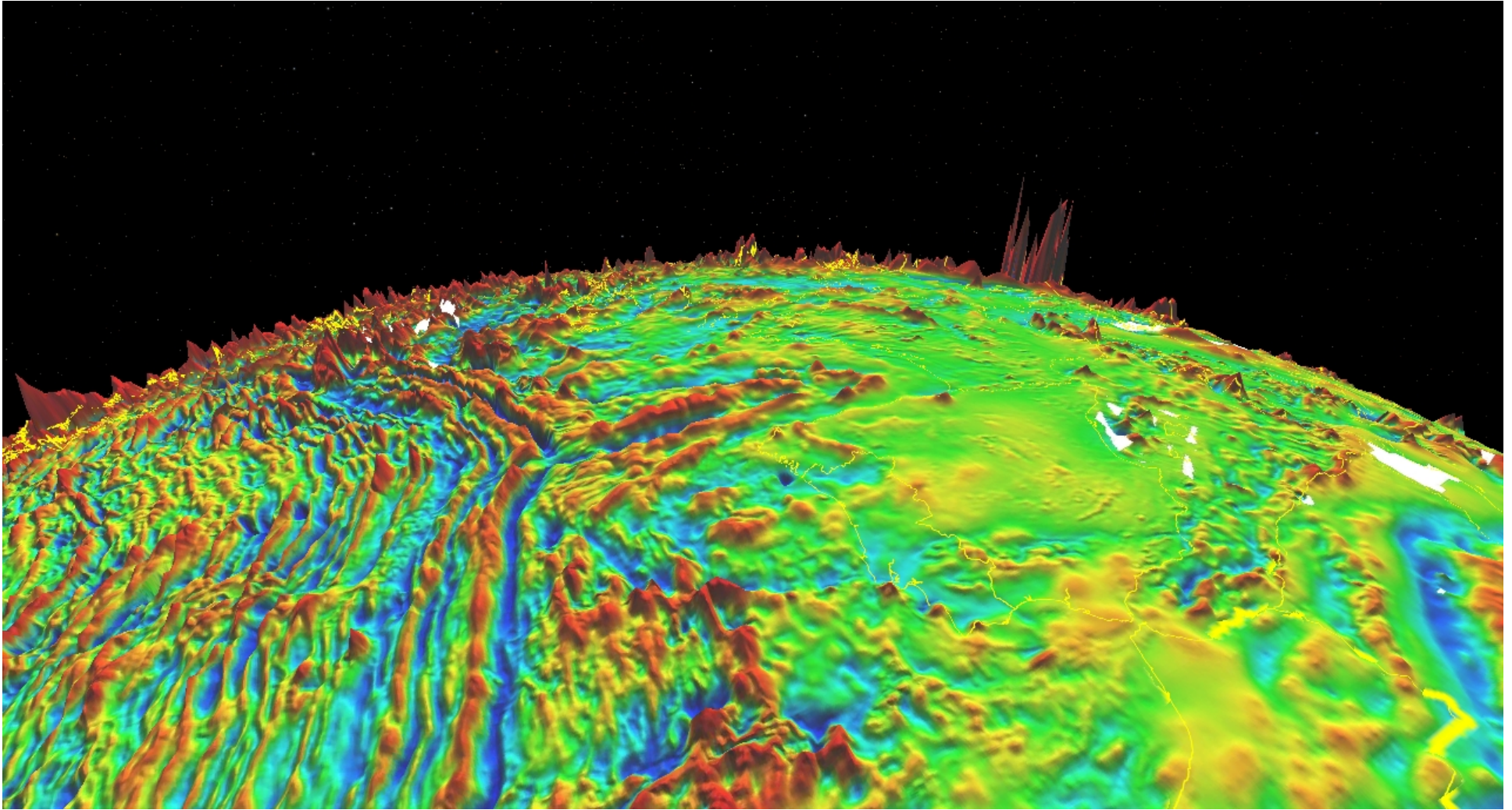
Scale 1: 120 000 000

Projection: Miller cylindrical

The Atlas of the Earth's Magnetic Field. Second Edition



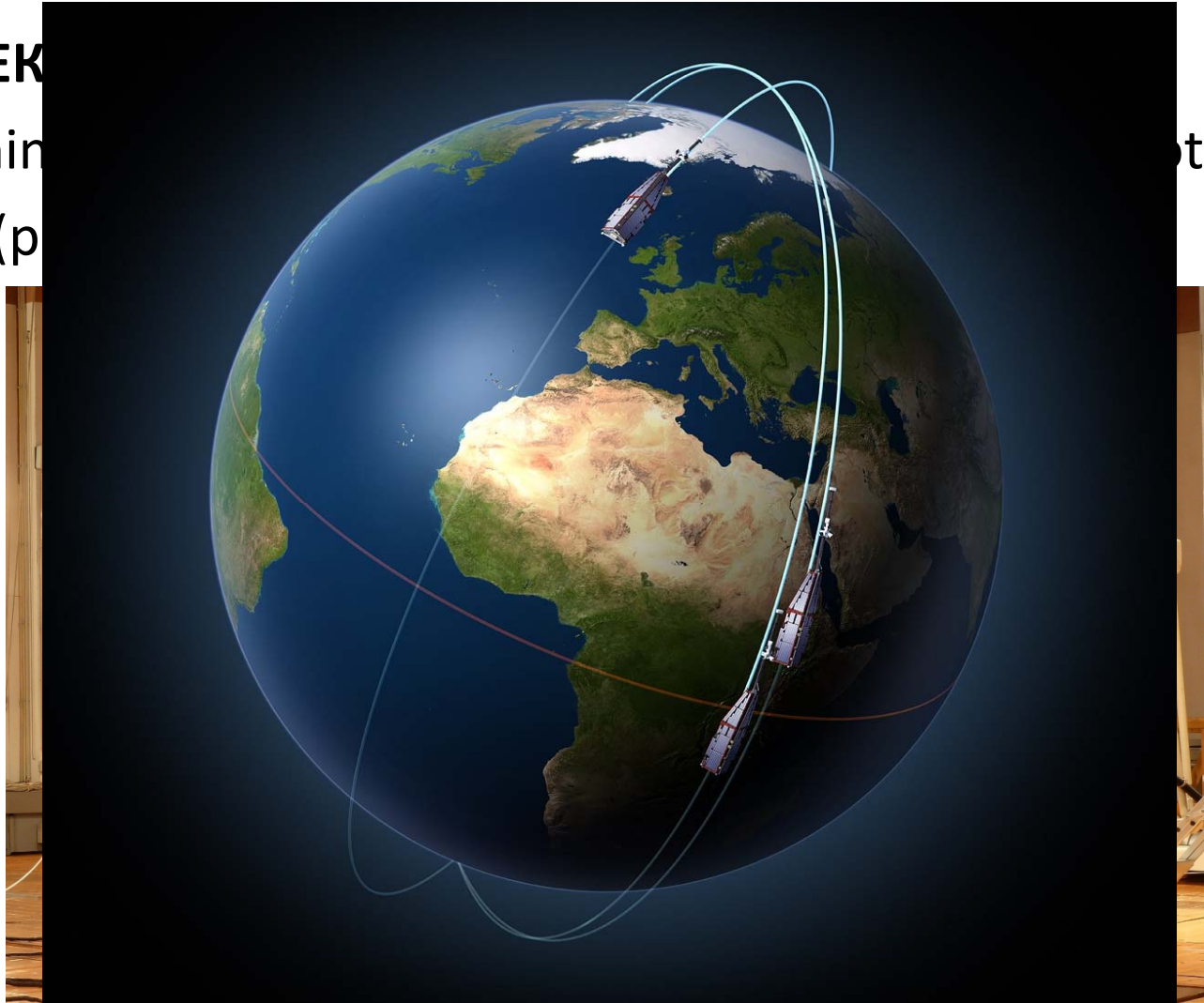
Anomalies of the Earth crust



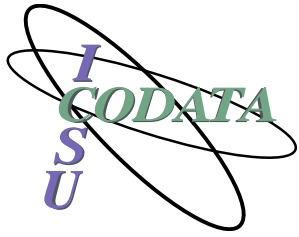
Satellites data

Mission EK

- launching
- 3 EAS (p



t»)



Preliminary content

Chapter 1. Historical maps: global and regional maps

Chapter 2. Current knowledge of the magnetic field

Subchapter 2.1 Main field. From -8000 to 2020. SWARM data

Subchapter 2.2 Crustal field. WDMAM 2 ed. Regional scale maps

Subchapter 2.3 External field

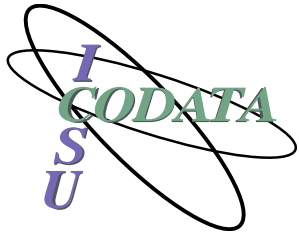
Chapter 3. Magnetic fields of the Solar System

Subchapter 3.1 Magnetic field of Mars etc.

Subchapter 3.2 Magnetic field of the Sun

Chapter 4. Applications of the magnetic field data

Chapter 5. Auxiliary maps and data



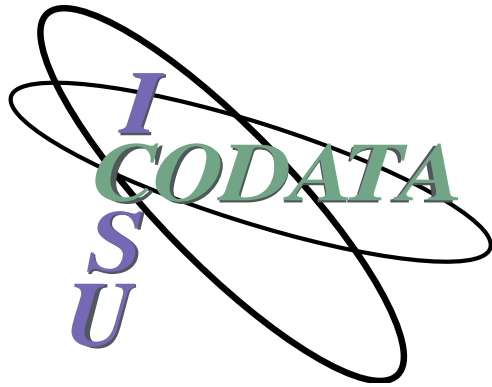
PARTNERSHIP CONFERENCE

“Challenges in geodata processing”

19 - 22 July 2016

Sochi region, Mountain cluster, Russia





ICSU

International Council for Science

Thank you for your attention!

Alena Rybkina
member of EC

www.codata.org

<http://lists.codata.org/mailman/listinfo/codata-international> lists.codata.org

Email: a.rybkina@gcras.ru

Twitter: @codatanews

CODATA (ICSU Committee on Data for Science and Technology), 5 rue Auguste Vacquerie, 75016 Paris,
FRANCE