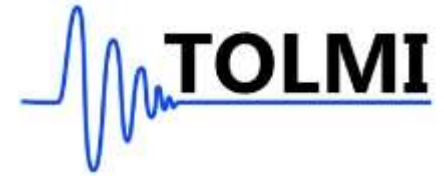


Tomsk Open Laboratory for Material Inspections



Tomsk – 2012



Tomsk **O**pen **L**aboratory for **M**aterial **I**nspections

A Status Report on its

- Mission
- Objectives
- Strategy
- Organization and Resources
 - Results



TOLMI MISSION

**EXCELLENCE & RELEVANCE
OF
SCIENCE**



МИНИСТЕРСТВО ОБРАЗОВАНИЯ
И НАУКИ РОССИЙСКОЙ
ФЕДЕРАЦИИ
(МИНОБРНАУКИ РОССИИ)

**Open Grant of
the Government of
the Russian Federation**

Designed to support

research projects
implemented by leading Scientists at
Russian Institutions of higher learning



TOLMI MISSION

KNOWLEDGE CREATION

EDUCATION

KNOWLEDGE DISTRIBUTION

RECOGNITION

EXCELLENCE

**REFRAMING
OF
SCIENCE**

RELEVANCE

GLOBALIZATION

SOCIO-ECONOMIC UTILIZATION

SCIENCE PRODUCT MARKETING



TOLMI MISSION

**EXCELLENT & RELEVANT APPLIED SCIENCE
THROUGH NATIONAL & INTERNATIONAL**

**KNOWLEDGE AND TECHNOLOGY MANAGEMENT
MARKET AND PRODUCT DRIVEN R&D PROJECTS
FUNDAMENTAL & PROFESSIONAL STUDENT EDUCATION**

**FOR THE DEVELOPMENT OF
INNOVATIVE METHODS, INSTRUMENTS, SYSTEMS, SERVICES
TO BE APPLIED IN INDUSTRY**

SAFE TECHNICAL STRUCTURES – CERTIFIED QUALITY PRODUCTION



TOLMI OBJECTIVES

KNOWLEDGE GENERATION (Next Three Years)

CORE RESEARCH

OBJECTIVES

COMPETENCIES

STRATEGY

PHD THESES **NEW KNOWLEDGE**

SUSTAINABLE DEVELOPMENT

TOLMI AGENTS



TOLMI OBJECTIVES

EDUCATION (Next Three Years)

SCIENTIFIC CULTURE:



- TEAM WORK
- INTERNATIONAL
- VISIONARIES
- RESULT ORIENTATION

FUNDAMENTAL SCIENCE:



- KNOWLEDGE SCREENING
- FILLING THE GAP

APPLIED SCIENCE:



- PRODUCTS/SYSTEMS
- SYSTEM ENGINEERING
- PROFESSIONAL MANAGEMENT

NEW BUSINESS

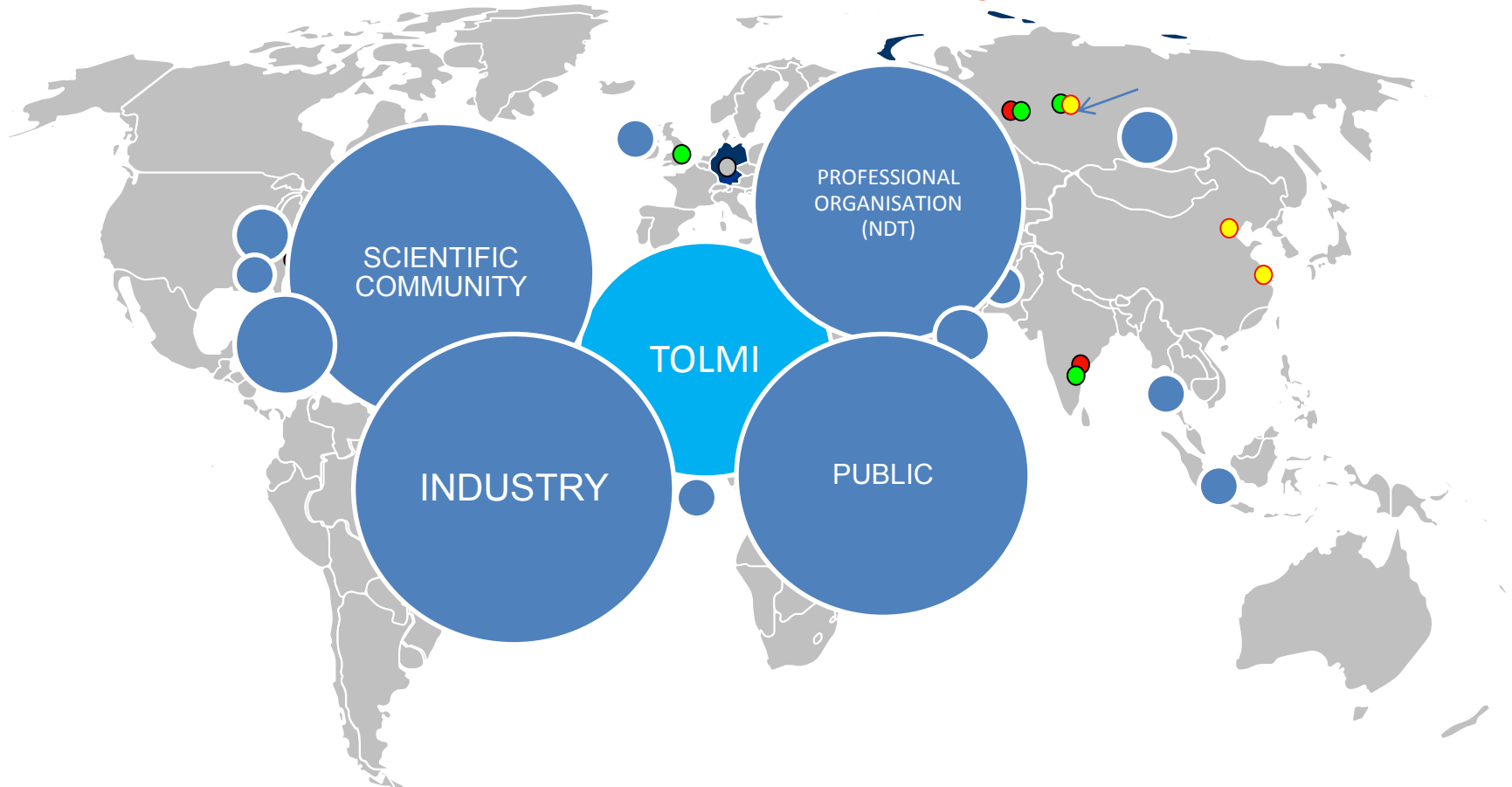


- STRATEGIC NETWORKS
- CUSTOMER BASED
- PROFIT BASED
- INNOVATION MANAGEMENT



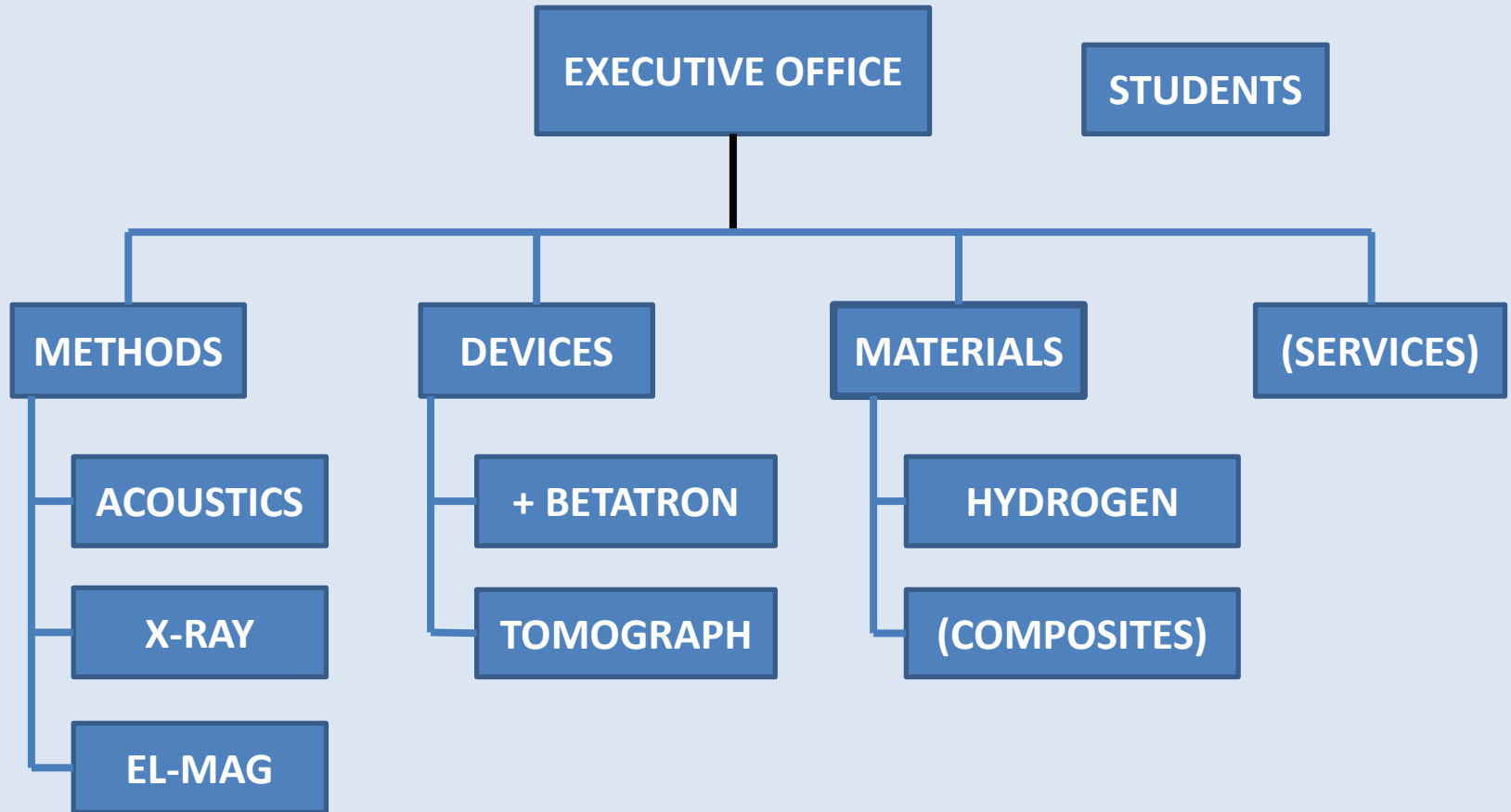
TOLMI STRATEGY

International Scientific Cooperation





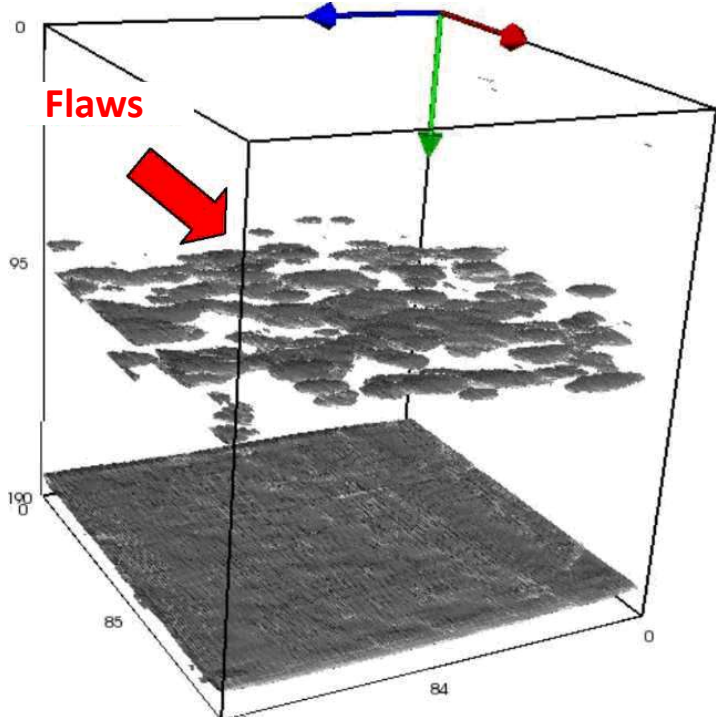
TOLMI ORGANIZATION





TOLMI EQUIPMENT

Real-time 3d ultrasound system



Result of inspection

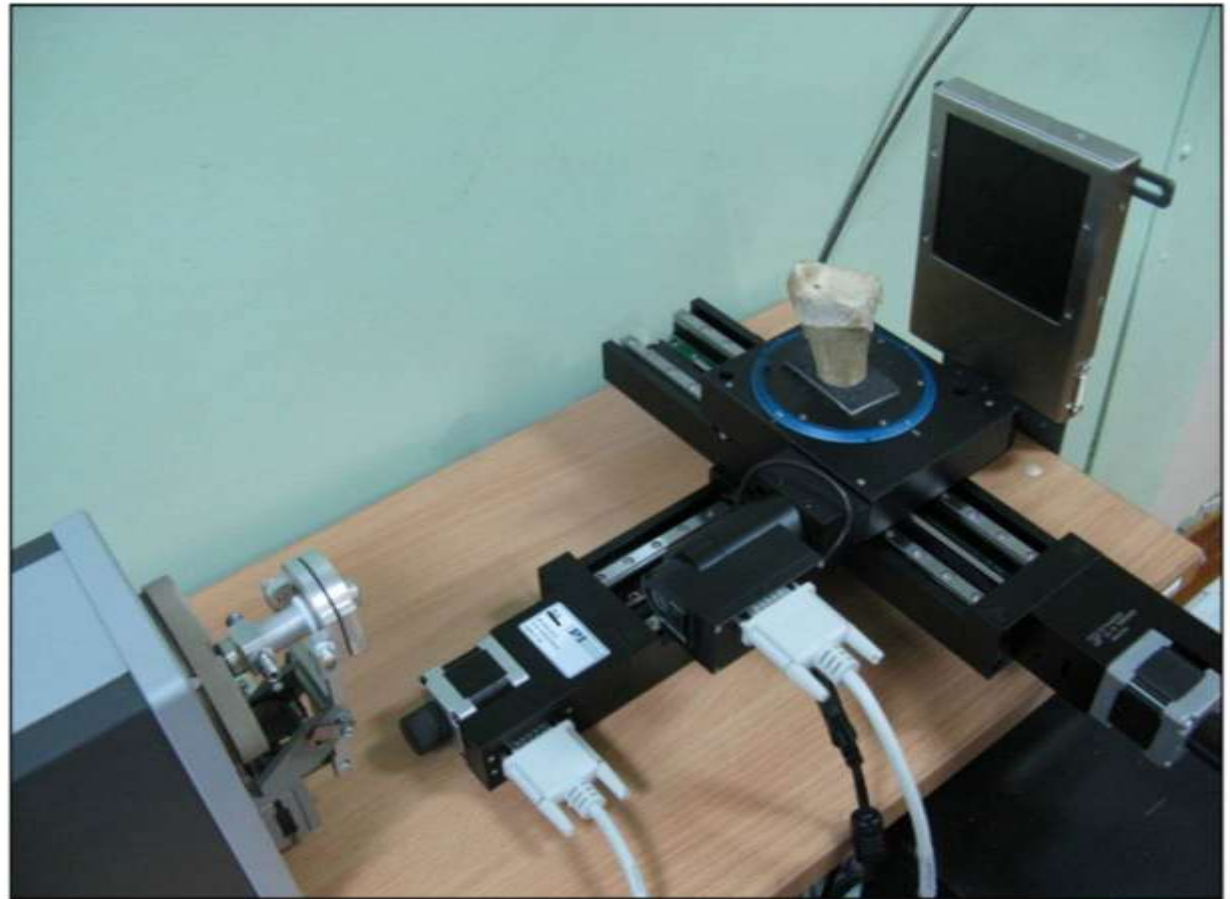


TOLMI EQUIPMENT

X-ray tomograph



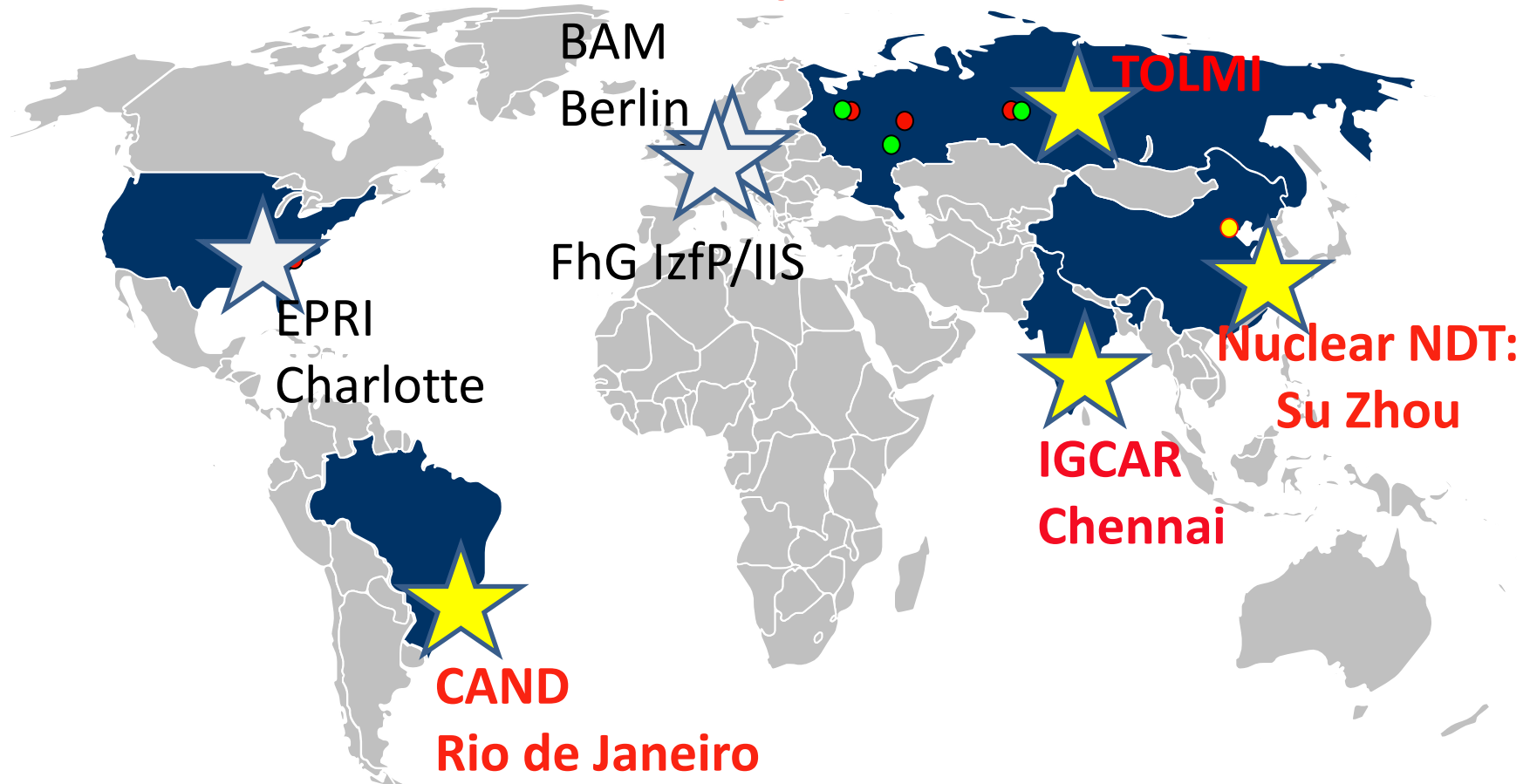
Result of inspection





TOLMI RESULTS

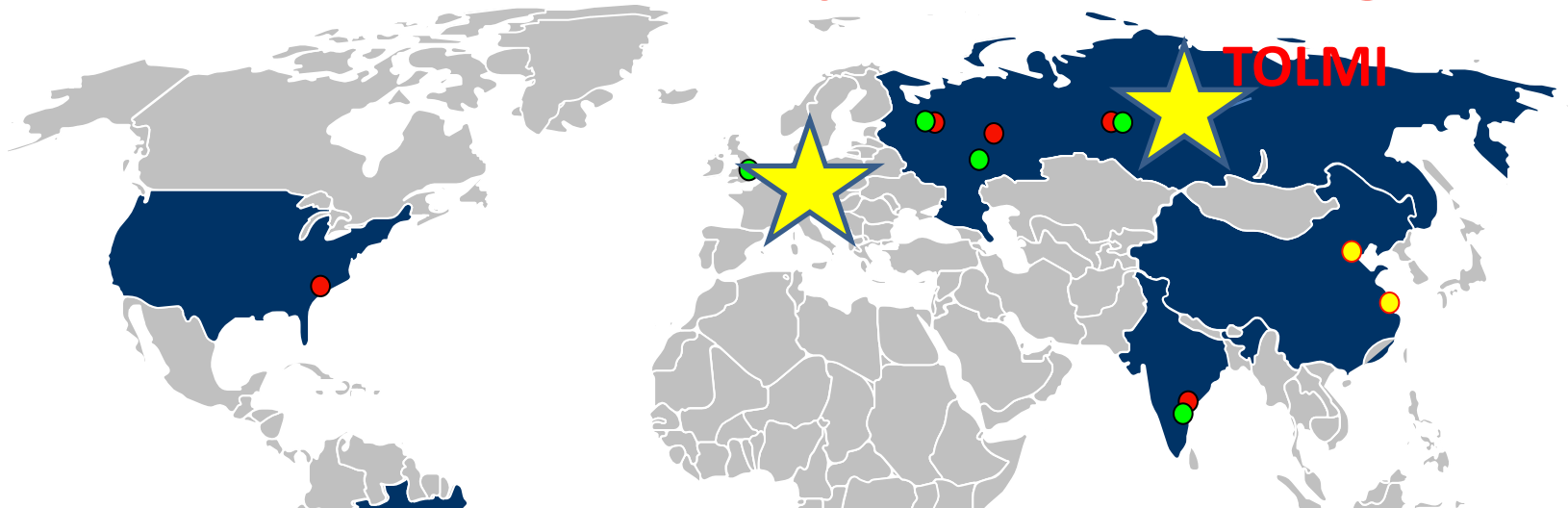
International Scientific Cooperation: NDT CENTERS





TOLMI RESULTS

International Scientific Cooperation: Matching Funds



Analytical High-resolution High-contrast Microtomograph

Partner University:

Universität of Leipzig with Fraunhofer Institute Nondestructive Testing IzfP, Germany

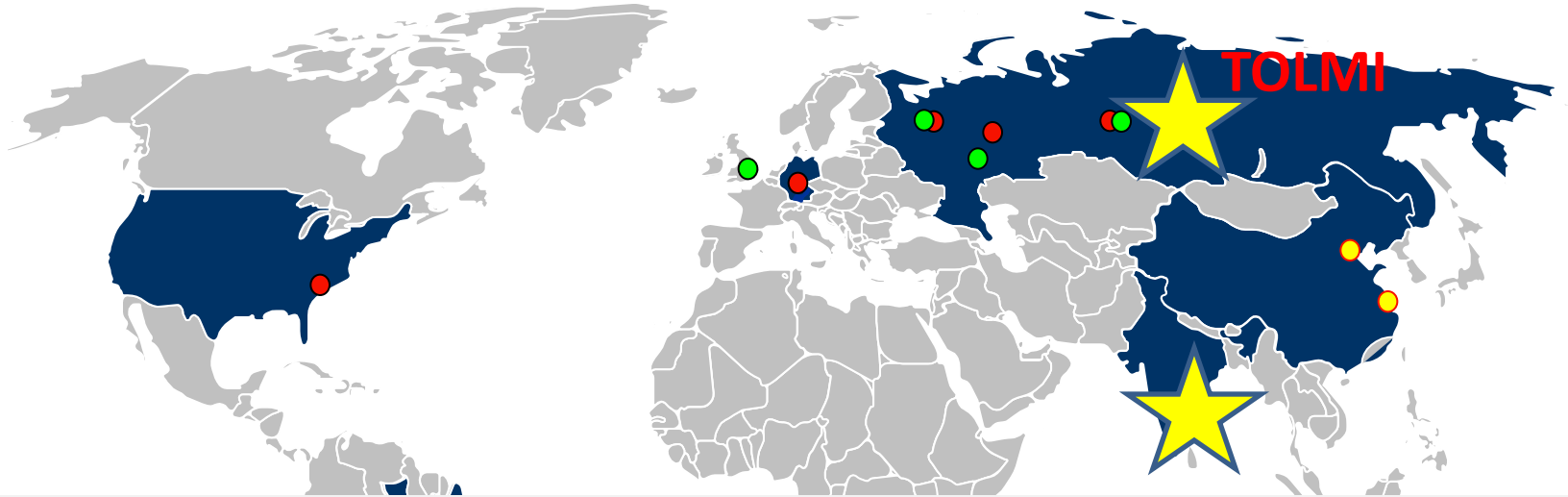
Contact: Prof. Meyendorf, Dr. Krüger, IzfP

Funding: about 1.000 T€



TOLMI RESULTS

International Scientific Cooperation: Matching Funds



**EMAT Inspection Technology for Nuclear/Petrochemical
Austenitic Components at Elevated Temperatures**

Partner University:

University at the Indira Gandhi Center for Atomic Research, IGCAR, Kalpakkam, India

Contact: Prof. Jayakumar

Funding: about 250 T€



TOLMI RESULTS

International Scientific Cooperation: Matching Funds



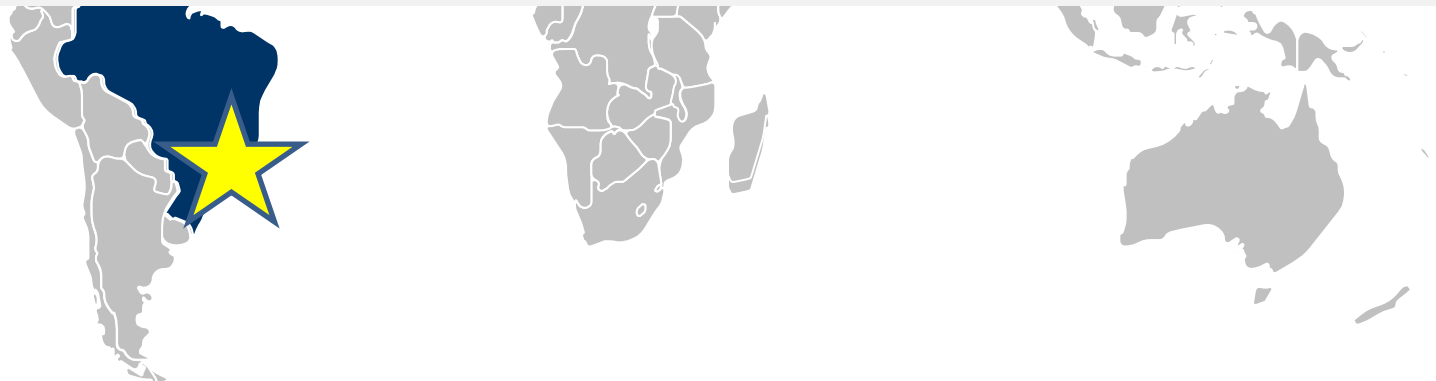
Thermography for the Fast Integrity Check of Radio-active Waste Containers

Partner University:

Catholic University of Rio de Janeiro PUC, Brazil

Contact: Prof. Braga

Funding: about 300 T€





TOLMI RESULTS

International Scientific Cooperation: Matching Funds



In-line Inspection Technologies for Light-weight Carbon Fiber Automotive Components

Partner University:

Technical University Dresden with Fraunhofer Institute Nondestructive Testing IzfP, Germany

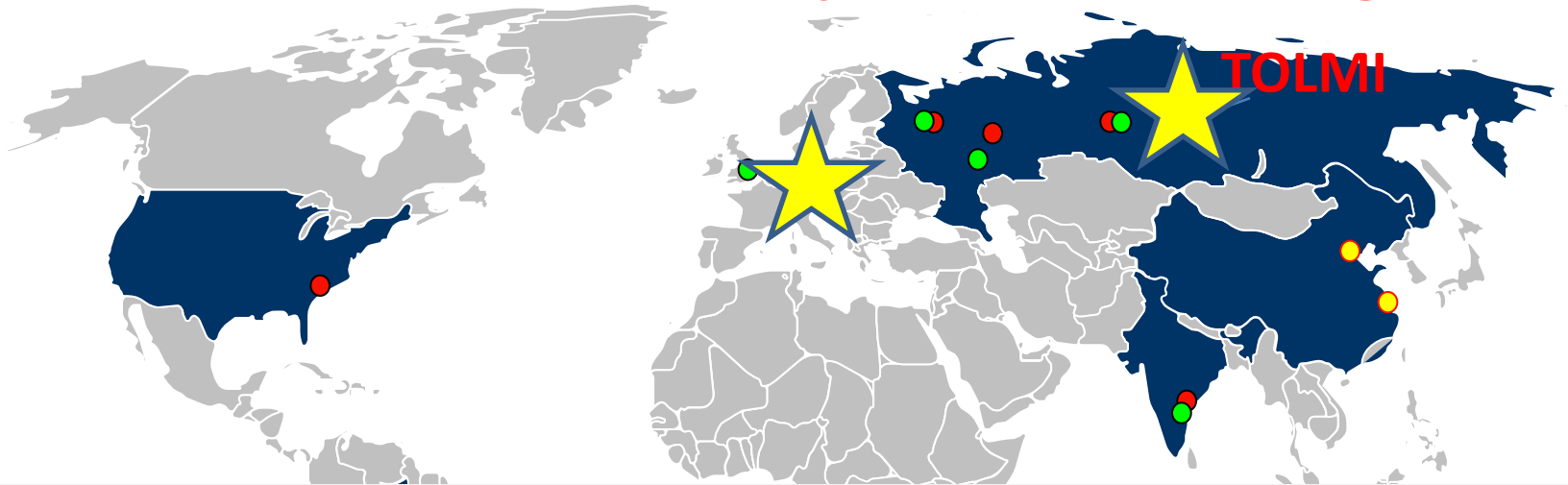
Contact: Dr. H. Heuer

Funding: about 300 T€



TOLMI RESULTS

International Scientific Cooperation: Matching Funds



High-resolution Industrial x-ray Micro-tomography

Partner University:

Julius-Maximilian – University Würzburg, Germany

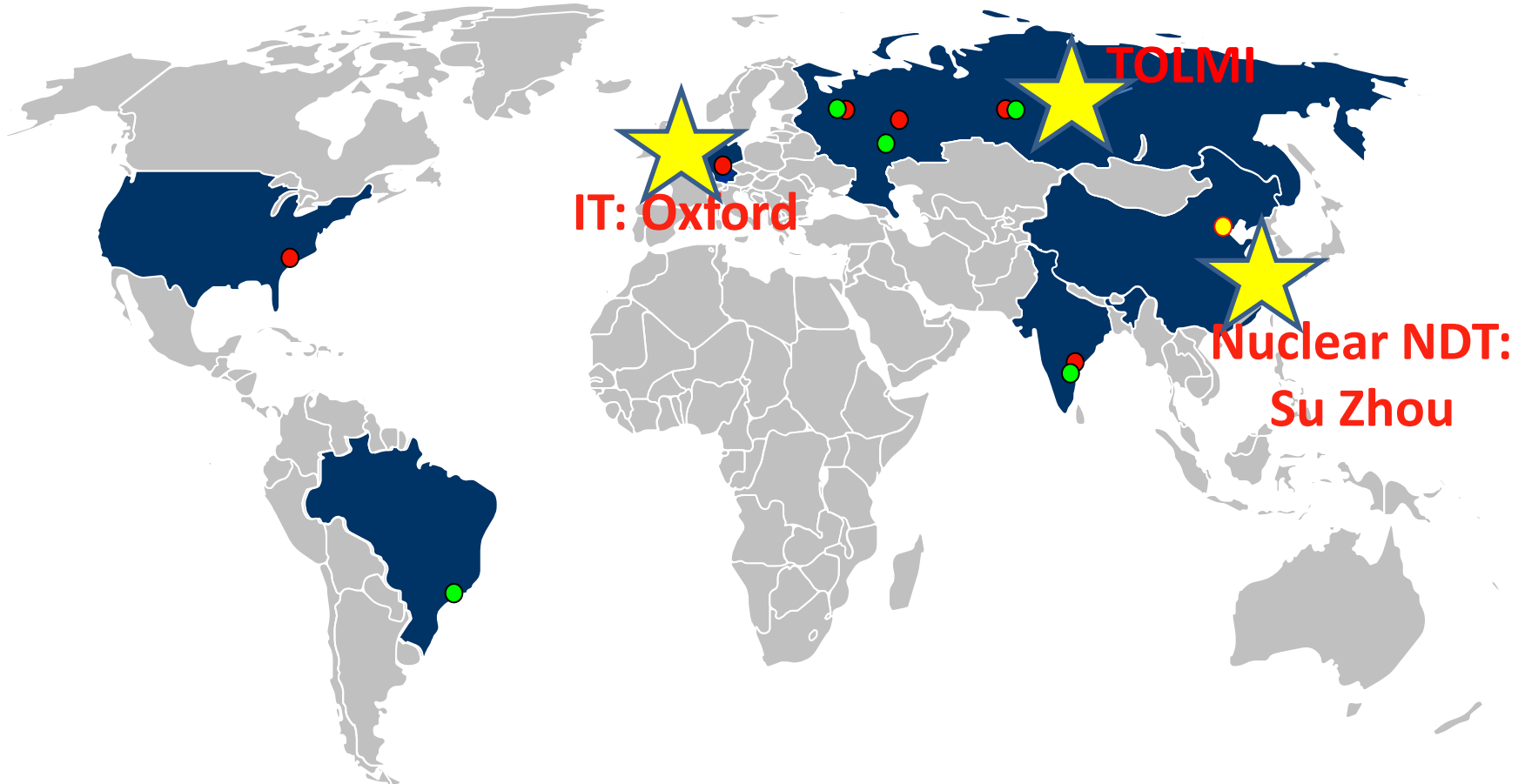
Contact: Prof. R. Hanke

Funding: about 700 T€



TOLMI RESULTS

International Scientific Cooperation: Matching Funds





TOLMI OUTSTANDING RESULTS

ACOUSTICS: Teachings

STUDENTS

International Grants:

TU Dresden/FhG IzfP, Germany:

Sparse Array Technology for Acoustic Transducers

IGCAR University Chennai, India:

Compressive Sampling of Acoustic Field Data

VISITING SCIENTISTS

Prof. Helmut Wolf, Anna University, Chennai, India

Risk Assessment of Structures with Flaws

Yerbol Zhantlessov, Saar-Universität, Saarbrücken, D

Migration Array Inspections

Krishna Mohan Reddy, LUCID/IIT Chennai, India

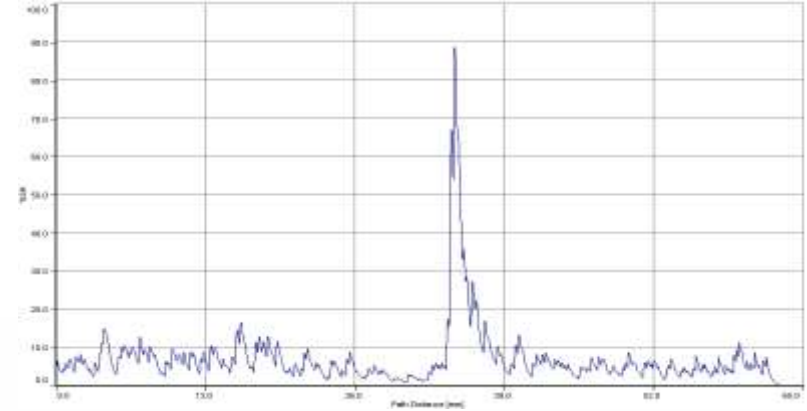
Implementation of Elasto-Dynamic Codes

General Electric – BAM – TU Karlsruhe



Pulse – Echo Technique

SIMULATION

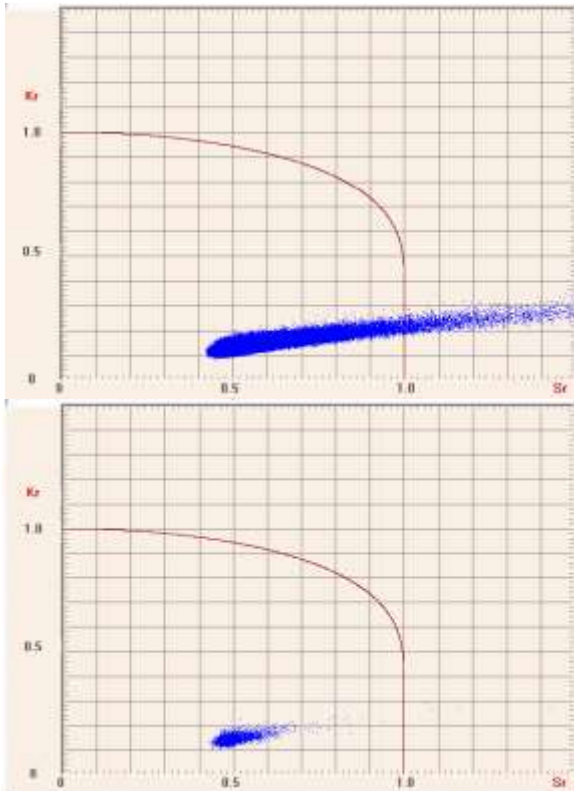




TOLMI OUTSTANDING RESULTS

ACOUSTICS: Teachings

STUDENTS



DISSERTATIONS:

Compressive Sampling of Acoustic Wave Field Data for Quantitative Ultrasonic Testing QUT

Upper Boundary Estimates of Flaws Detected by QUT for Probabilistic Fracture Mechanic Assessment of Risk of Failure



TOLMI OUTSTANDING RESULTS

ACOUSTICS: Teachings

STUDENTS

DISSERTATIONS:

Compressive Sampling of Acoustic Wave Field Data for Quantitative Ultrasonic Testing QUT

Upper Boundary Estimates of Flaws Detected by QUT for Probabilistic Fracture Mechanic Assessment of Risk of Failure

Optimization Rules for the Sparsing of Acoustic Arrays

([3-D Video.pptx](#))

Ultrasonic End Face Shaft Inspection System with Real-time 3D Imaging of Flaws



TOLMI OUTSTANDING RESULTS

ACOUSTICS: Product Orientation

- TECHNOLOGIES**
- 2012: Migration Array System for 3D Real-Time High-Resolution Inspections**
 - 2013: Sparse Array Transducer Design & Manufacturing**
 - 2013: UT – Robotics**





TOLMI OUTSTANDING RESULTS

ACOUSTICS: Product Orientation

- TECHNOLOGIES** **2012: Migration Array System for 3D Real-Time High-Resolution Inspections**
2013: Sparse Array Transducer Design & Manufacturing
2013: UT – Robotics
- INSTRUMENTS** **2012: End-Face 3D Inspection Device**
- SERVICES** **2013: Nonstandard Inspections; Compliance and Cohesion with International Codes and Regulations; Fracture Mechanic Flaw Evaluation QUT;**



TOLMI OUTSTANDING RESULTS

Electro-Magnetics: Product Orientation

- 3D GMR for Leakage Detection
- EC COIL Design Shop
- SensorFlux Systems
- EC Inspection Systems
- Fatigue State Analyzer

X – Ray: Product Orientation

- High Energy Betatron Radio- and Tomography
- X – ray Microanalyzer
- ANTIBETATRON with Positron Injector



TOLMI BUSINESS

p.€\$ One new company per year \$€p.

SHAREHOLDER:

- Market Knowledge
- Financing
- New Products
- Young Energy

SUPPORT

- Public Innovation Programs
- University:
Know-How & Technology
- TOLMI Network & Advice





**VISIT OF PRIME-MINISTER
OF RUSSIAN FEDERATION
MR. VLADIMIR V. PUTIN
TO INSTITUTE OF
NONDESTRUCTIVE
TESTING**

25.02.2012

14.06.2011



Michael Kröning

