



GLOBAL BIOLIMAGING

growing collaboration

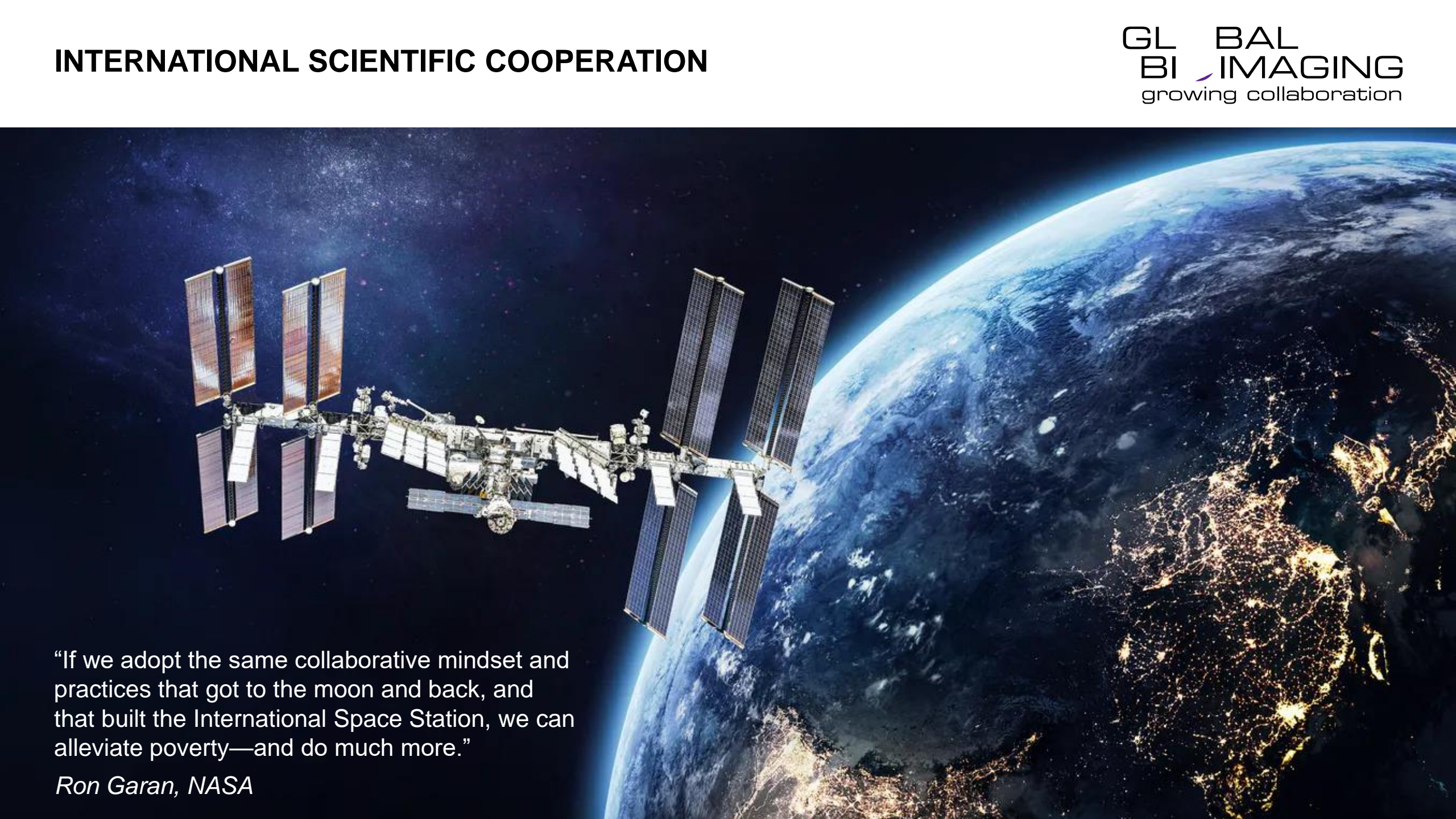
AN INTERNATIONAL NETWORK OF CUTTING-EDGE
BIOIMAGING FACILITIES AND COMMUNITIES

Federica Paina, Global BioImaging Manager

**Gleb Grebnev, Global BioImaging Training
Programme Manager**

INTERNATIONAL SCIENTIFIC COOPERATION

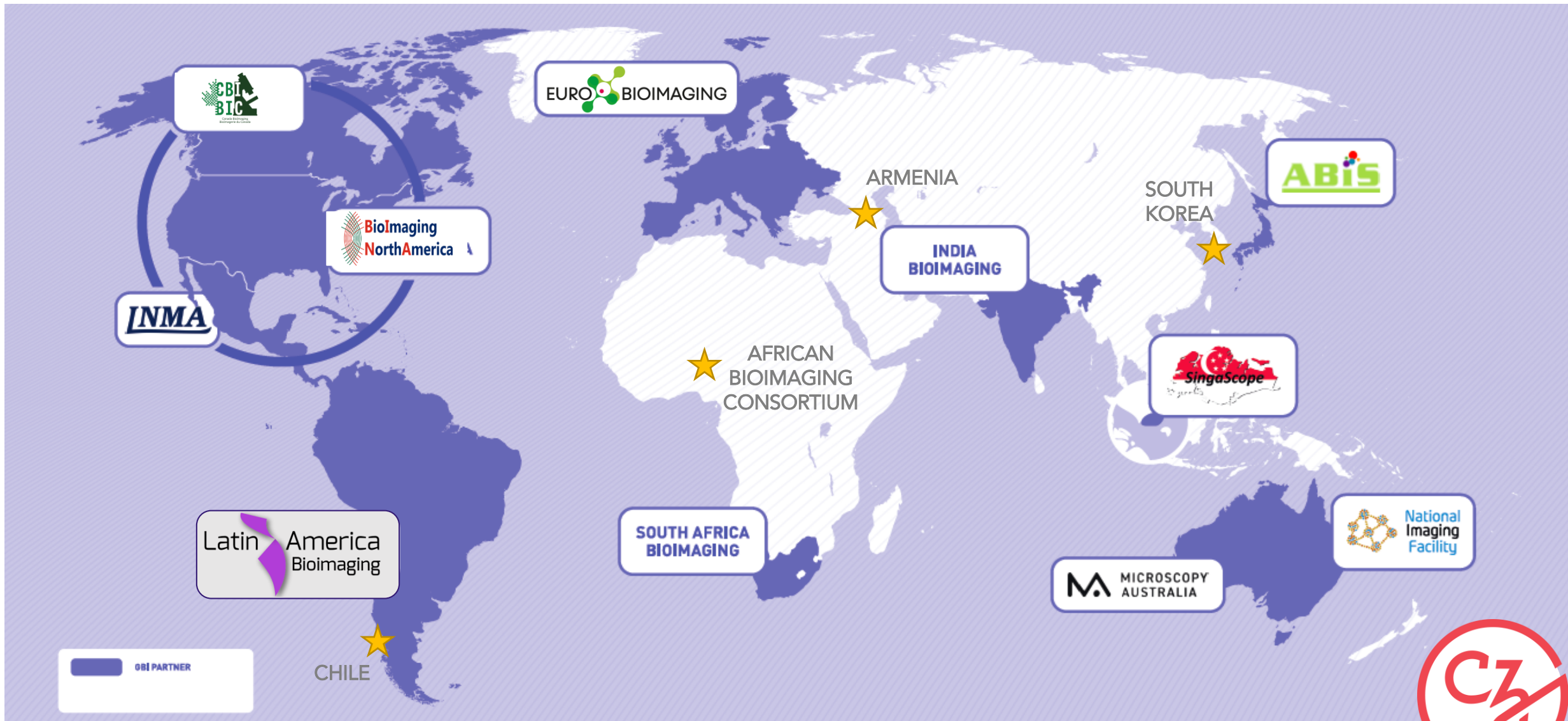
GLOBAL
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A high-resolution photograph of the International Space Station (ISS) in orbit above Earth. The station's complex structure, including multiple modules and large solar panel arrays, is clearly visible against the dark background of space. Below the station, the Earth's surface is shown at night, with a dense network of city lights illuminating the continents. The curvature of the Earth is visible on the right side of the frame, showing the transition from the dark night to the blue and white clouds of the day side.

“If we adopt the same collaborative mindset and practices that got to the moon and back, and that built the International Space Station, we can alleviate poverty—and do much more.”

Ron Garan, NASA

THE GBI NETWORK TODAY



THE COMMUNITY IS THE KEY



“Exchange of Experience IV” meeting, Singapore, 13-14 September 2019

ABOUT US & OUR GOALS

- ✓ **International, open network** of imaging infrastructures and communities
- ✓ **Started in 2015**, from bilateral agreements between Euro- and partners in India and Australia
- ✓ **Community effort**, connecting imaging scientists, facility and managerial staff, makers



- To **cooperate** internationally and **propose solutions** to the challenges faced by the imaging community globally
- To build a strong case that **imaging technologies and research infrastructures are key** in the advancement of life sciences
- To **build capacity** internationally, leveraging on each other's strengths and capabilities

“EXCHANGE OF EXPERIENCE” WORKSHOPS



Annual gathering of the community since 2016:

- ✓ 2016 (EMBL, Europe): Best practices in imaging facility operation
- ✓ 2017 (Bangalore, India): Open user access policy
- ✓ 2018 (Sydney, Australia): Quality Management
- ✓ 2019 (Singapore): Career Path for Facility Staff
- ✓ 2020 (online): Pre-publication image data
- ✓ 2021 (online): Imaging Infrastructures in a time of change
- ✓ 2022 (Uruguay, hybrid event): Theme TBD



Great networking opportunity in 2022 for the Latin American community!



60-80 pax (in person events)
120-160 pax (online events)



All continents
represented

WORKING GROUPS & INTERNATIONAL RECOMMENDATIONS

- **Image Data Management**
J. Moore (EUR), S. Onami (JPN)
 - Commentary published in Nature Methods: “A Global View of Standards for Open Image Data Formats and Repositories”
- **Career Development for imaging core facility staff**
G. Wright (SIN)
 - Under preparation: “A global view on how to promote a sustainable career path for staff working in imaging core facilities”
- **Increasing the involvement of the biomedical community**, G. Galloway (AUS)
 - To accelerate translational applications of imaging



WORKING GROUPS – JOIN VIA OUR WEBSITE!

- **Societal impact of Imaging Research Infrastructures** C. Brown (CAN), A. Keppler (EUR)
- **Training**, G. Grebnev (EUR)
- **Quality Management in imaging facilities** J. Rothacker (AUS)

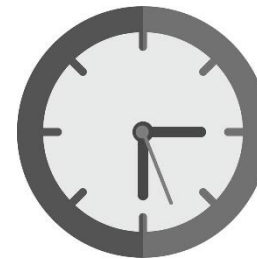
- International Recommendation: “*Measuring imaging core facility impact: KPIs and SEIs*”
- Kicked off: How imaging cores and infrastructures contribute to Sustainable Development Goals
- To expand and improve the GBI training curriculum
- Focussing on ISO 9001 applied to imaging Core Facilities



About 50 international experts involved



All GBI partners represented



Working together since 2018

Interested to contribute?
JOIN US!



SUPPORT TO LOCAL/REGIONAL IMAGING COMMUNITIES

- Showing international endorsement, eg:
 - Letters of support to national applications
- Advocating for international/biregional funding:
 - E.g., discussing with EU-CELAC Working Group on research infrastructures
- Participating to local events
- Training events in the region (or targeting a specific time-zone)



18 June 2021

10h00-12h30 UYT/15h00-17h30 CEST

"Latin American Bioimaging Network: facts, experiences, and challenges"

A Satellite meeting of the RI-VIS Latin America – Europe Symposium on Research Infrastructures

Satellite Meeting June 2021

Training initiatives



Want to learn more?

<https://www.globalbioimaging.org/international-training-courses-for-core-facility-staff>

<https://www.globalbioimaging.org/international-job-shadowing-program>

1. Training for imaging core facility staff

- Thematic training events
- Jointly organized by Global BioImaging and one of its partners
- Delivering training to imaging core facility staff & imaging scientists

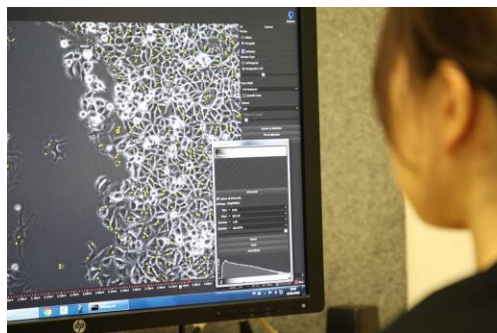
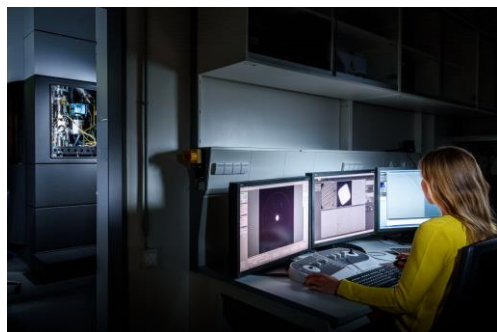
2. International job shadowing programme

- International staff exchange
- Imaging core facility staff visit another imaging facility
- Exchange of experiences and ideas; added value to support networking; prepare possible future collaborations between imaging infrastructures

3. Training Resource

- New initiative at the Global BioImaging
- Community-driven Training Resource For imaging core facility staff and researchers utilizing imaging and microscopy

Training for imaging core facility staff



Training events

- **Organized in collaboration with GBI partners**
- **Target audience:** imaging infrastructure/imaging core facility staff
- Training events open to **international participants** from around the globe
- Taught by **Global BioImaging partners** and **external companies**
- **Training resource:** category and module-based resource of up-to-date and relevant to imaging community material

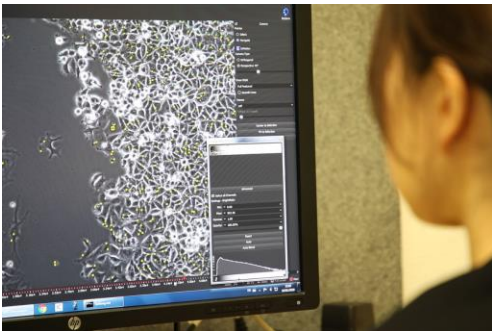
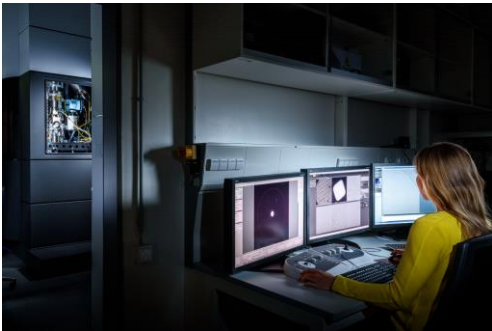
Collaborative approach

- Work alongside with Global BioImaging partners to deliver courses
- BioImage Analysis course in 2018 (co-organization by Global BioImaging and **Japan's ABiS**)
- Bangalore Microscopy Course 2021: **collaboration with India BioImaging Consortia**
- Management and Operation of Imaging Core Facilities course in 2021: **collaboration with Canada BioImaging**

Themes of GBI Courses

- **Management and operation of imaging core facilities**
 - *Negotiation and persuasion*
 - *Culture and teamwork*
 - *Budgeting and accounting*
- **Image data management and analysis**
 - *Data management solutions*
 - *Image data repositories*
 - *Sharing of image data*
 - *Image analysis concepts*
 - *Applications of software packages such as ImageJ/Fiji, CellProfiler, ilastik*
- **Imaging technologies and applications**
 - *Light microscopy*
 - *Electron microscopy*
 - *Biomedical imaging*

Training Events in 2022 & Further Plans



Planned Training Events

- **January 2022: Image Data Course 2022**
 - OMERO data management system
 - Image data repositories: BioImage Archive, Image Data Resource (IDR), and Electron Microscopy Public Image Archive (EMPIAR)
- **January/February 2022: Core Facility Management Systems**
- **February 2022: BioImage Hackaton: OME-ZARR**
- **February 2022: Next generation image file format for sharing big image data in the cloud**
- **March 2022: GBI-ZEISS training collaboration:**
 - Scanning Electron Microscopy (SEM) webinar series
 - From sample prep to application of high-end SEM methods

TBD: How to generating training material and overview of available training resources

Towards in-person Events Around the Globe

- **Begin planning** in-person events for Q4 and/or Q3 2022
- **Implement a back-up plan** to host the event virtual in case of sudden travel restrictions and/or lockdown
- **Consider a hybrid approach** taken into account the cost of delivering a hybrid event

International job shadowing program

International job shadowing program

- **An on-the-job training opportunity**
 - Completes the Global BioImaging training program offer
 - May prepare future collaborations
 - Program is open since Q4 2016
 - Ca. 50 job shadowing applications via Global BioImaging
 - Inspired national-local initiatives
 - Travel support is available
- **22 hosts** are available in Australia, Europe, India, South Africa, Singapore, and the USA
 - **Varied offer** depending on facility focus and expertise - details on the website
 - Easy **online application** (no deadline)
















Complete list of the hosts & application form can be found here:

<https://www.globalbioimaging.org/international-job-shadowing-program>



Pictured are Markku Saari (left), a light microscopy specialist and job shadowing host at Turku Bioscience research center (Turku, Finland) and Neftali Flores-Rodriguez (right) from University of Sydney, a job shadowing program participant.

International job shadowing host facilities

	Australia	Perth	Centre for Microscopy, Characterisation & Analysis, University of Western Australia	Bio/Geo
	Australia	Gilles Plains	Preclinical Imaging & Research Laboratories, SAHMRI	Med
	Czech Republic	Prague	Microscopy Center, Institute of Molecular Genetics ASCR	Bio
	EMBL	Heidelberg	Advanced LM and EM Facilities of the Euro-Biolmaging EMBL Node	Bio
	Finland	Turku, Helsinki, Oulu	Finnish Advanced Light Microscopy Node	Bio
	France	Paris, Nantes, Rennes, Bordeaux, Montpellier, Marseille	France Biolmaging	Bio
	India	Bangalore	Central Imaging and Flow Cytometry Facility, NCBS	Bio
	India	Pune	Indian Institute of Science Education and Research (IISER) Pune - Microscopy Facility	Bio
	Italy	Torino, Pisa	Molecular Imaging Italian Node	Med
	Singapore	Singapore	A*STAR Microscopy Platform (AMP)	Bio
	South Africa	Stellenbosch	Central Analytical Facilities (CAF), Fluorescence Microscopy Unit	Bio
	USA	Ashburn	Advanced Imaging Center, HHMI Janelia Research Campus	Bio
	USA	Cambridge (MA)	Harvard Center for Biological Imaging	Bio
	USA	Boston	Nikon Imaging Center at Harvard Medical School	Bio
	USA	Berkeley	UC Berkeley - CRL Molecular Imaging Center (MIC)	Bio

The Shadowing Offer

Main focus

- Aspects related to user access
- Quality management
- Core facility management
- Hands-on: all of our instruments (full details on website)
- Training course organisation and execution, training process for new users

Other Activities

- A*STAR/Singapore-wide seminars
- Other events taking place during the stay

Preferred position of applicant

- Facility manager
- Imaging specialist

Duration of stay

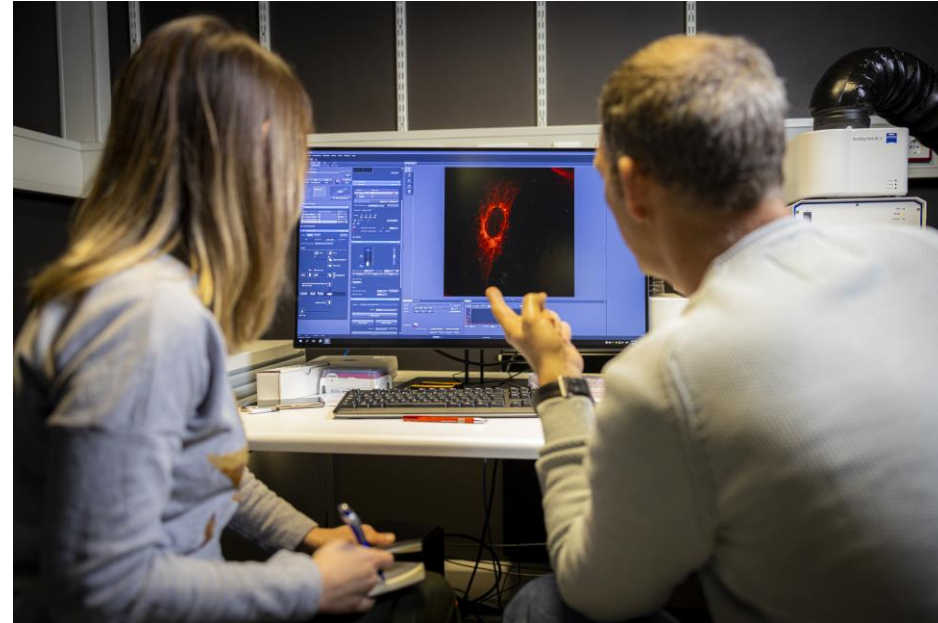
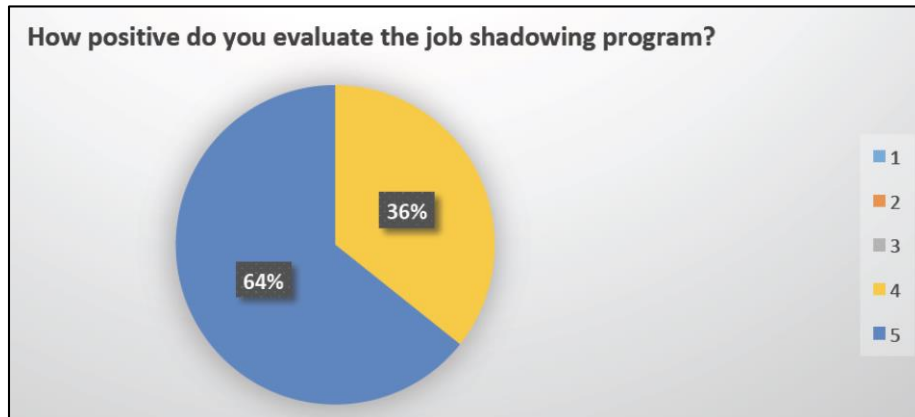
- Up to 5 days

Complete list and how to apply can be found here:

<https://www.globalbioimaging.org/international-job-shadowing-program>

Job shadowing program so far

Year	Applications	Travelled (with GBI travel grants)
2016	11	7 (6)
2017	20	3 (3)
2018	15	8 (6)
2019	6	5 (0)



Staff who visited imaging facility on other continent for 1-2 weeks reported to have:

- Improved their skills
- Brought new ideas to their facilities back home
- Started new international collaborations

Global Bioluminescence Training Resource

Brief overview

- Platform provides opportunity to display material in a structured and organized manner for the purpose of training or providing information

Training Platform

- Platform is **located on Global Bioluminescence website**
- **No barriers to entry** (no registration)
- Training Resource displays **curated and vetted material**
- Material that is displayed needs to be **publicly available**
- Types of material
 - training and educational
 - informative
- Supported by Global Bioluminescence **Working Group on Training**

Training Platform

- Platform does not store any material on it
 - **No issue with ownership**
- Material is stored elsewhere (e.g. videos on various YouTube channels)
- **Community-driven Training Resource**
- **Provide acknowledgement** of the source of the material and speakers/instructors and their affiliations

Example of a module

MODULE
05

Image data repositories (16 topics)

USER INTERMEDIATE 3 hours 8 mins 9 secs
Last updated No date provided

This module invites you to learn about exiting image data repositories that provide open access to light microscopy and electron microscopy images and associated metadata. Image data repositories include BioImage Archive, Image Data Resource (IDR), and Electron Microscopy Public Image Archive (EMPIAR).

What is Image Data Resource (IDR)

The Image Data Resource, IDR, is a public repository of image datasets from published scientific studies, where the community can submit, search and access highly annotated datasets. The IDR makes datasets that have never been previously accessible publicly available, allowing the community to search, view, mine and even process and analyze large, complex, multidimensional life sciences image data. Sharing of image data promotes the validation of experimental methods and scientific conclusions, the comparison with new image data obtained by the global scientific community, and enables data reuse by developers of new image analysis and processing tools.

Introduction to Image Data Resource (IDR)

Brief introduction to the Image Data Resource (IDR) in the form of presentation slides.

Workshop: Image Data Resource (IDR)

Presenter: Petr Walczysko, Open Microscopy Environment, University of Dundee, Dundee, Scotland

Workshop: Image Data Resource (IDR) - Topics

- Complete overview of Image Data Resource (IDR)
- How to browse and search the data in IDR and briefly explain the submission process
- Demonstrate how to integrate a variety of image processing tools such as ImageJ/Fiji, ilastik, and CellProfiler in a Jupyter notebook environment and use these for analysis of the images and metadata stored in IDR

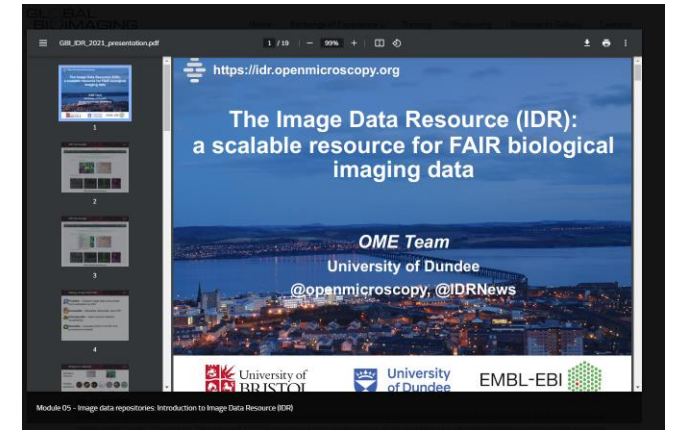
Supplementary material for Workshop: Image Data Resource (IDR)

Access Image Data Resource (IDR)

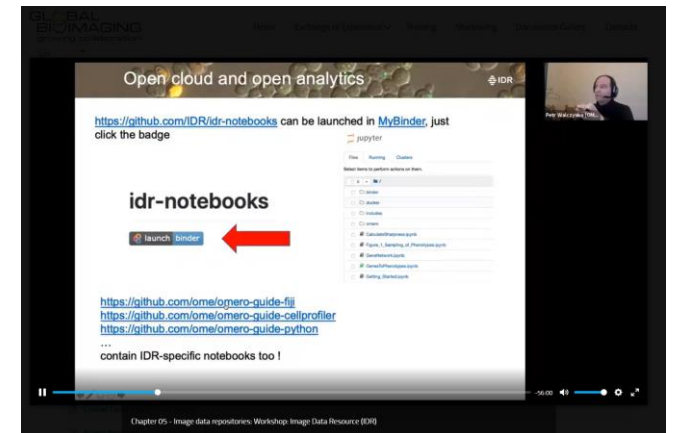
Text

PDF

Video



PDF reader



Video player

External
link

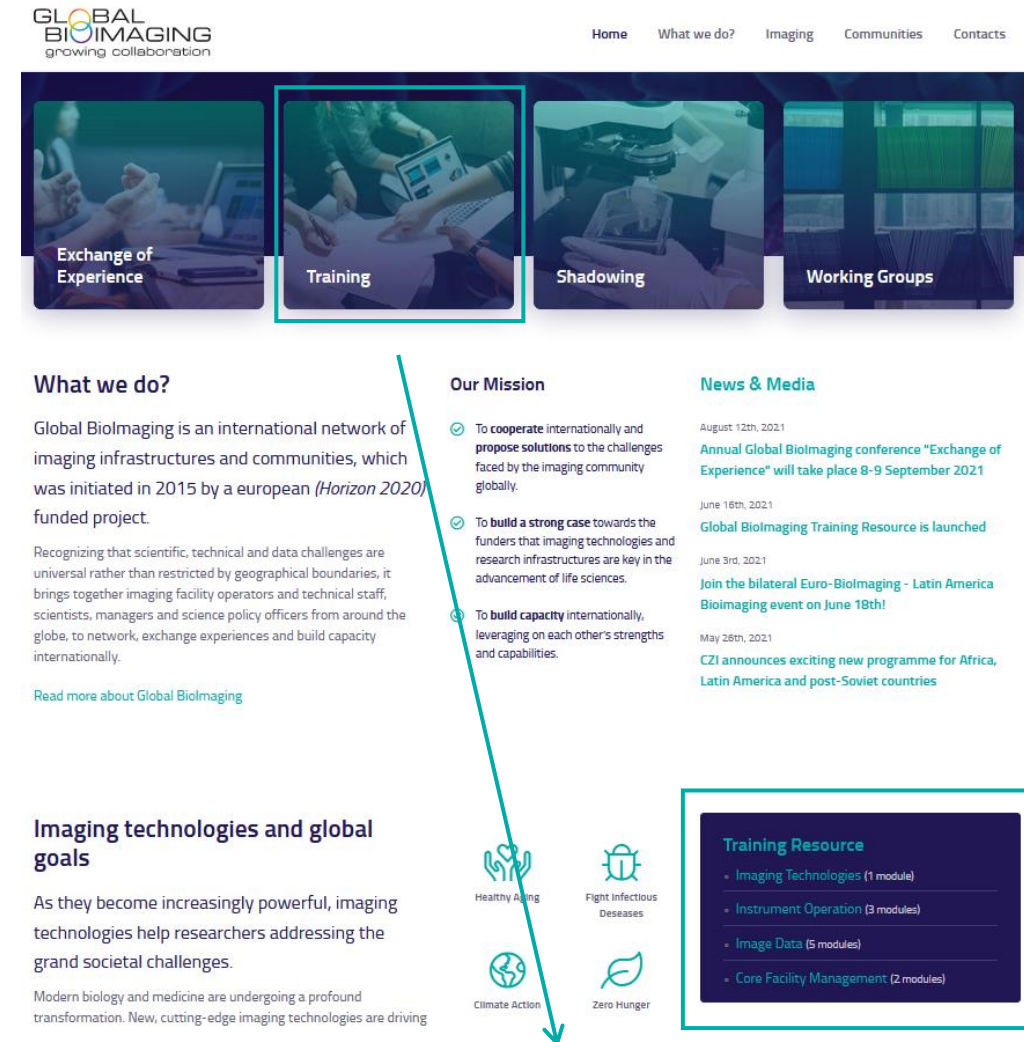
Current status

Current status

- Platform has been launched on 16 June 2021
- 4 different categories**
- 11 modules**
- ≈ 30 hours of training material**
- Existing modules serve as examples to demonstrate:
 - How modules can be structured
 - Curation and vetting is required
- As a **Community-driven Training Resource**, members of the imaging community are encouraged to contribute to growing the resource

Access the Training Resource:

<https://globalbioimaging.org/international-training-courses/repository>



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Home What we do? Imaging Communities Contacts

Exchange of Experience Training Shadowing Working Groups

What we do?

Global BioImaging is an international network of imaging infrastructures and communities, which was initiated in 2015 by a european (*Horizon 2020*) funded project.

Recognizing that scientific, technical and data challenges are universal rather than restricted by geographical boundaries, it brings together imaging facility operators and technical staff, scientists, managers and science policy officers from around the globe, to network, exchange experiences and build capacity internationally.

[Read more about Global BioImaging](#)

Our Mission

- To **cooperate** internationally and **propose solutions** to the challenges faced by the imaging community globally.
- To **build a strong case** towards the funders that imaging technologies and research infrastructures are key in the advancement of life sciences.
- To **build capacity** internationally, leveraging on each other's strengths and capabilities.

News & Media

August 12th, 2021
Annual Global BioImaging conference "Exchange of Experience" will take place 8-9 September 2021

June 16th, 2021
Global BioImaging Training Resource is launched

June 3rd, 2021
Join the bilateral Euro-BioImaging - Latin America Bioimaging event on June 18th!

May 26th, 2021
CZI announces exciting new programme for Africa, Latin America and post-Soviet countries

Imaging technologies and global goals

As they become increasingly powerful, imaging technologies help researchers addressing the grand societal challenges.

Modern biology and medicine are undergoing a profound transformation. New, cutting-edge imaging technologies are driving

Healthy Aging Fight Infectious Diseases Climate Action Zero Hunger

Training Resource

- Imaging Technologies (1 module)
- Instrument Operation (3 modules)
- Image Data (5 modules)
- Core Facility Management (2 modules)



Thank you for your attention!



@GlobalBioImage



www.globalbioimaging.org

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