

CoARA Action Plan 2024 – 2027

of the

Italian Institute of Technology

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Context

The assessment of research at the Italian Institute of Technology (IIT) has always recognized the importance of diverse scientific outputs. A proper and just research assessment seeks a variety of perspectives and considers multiple levels of analysis: scholarly, economic, and societal. To support institutional decision-making processes, a responsible and transparent use of quantitative indicators is coupled with an expert and qualitative judgement, for which peer review is central.

The institutional systems of evaluation are sensitive to the evolving needs of IIT and responsive to the changing nature of the research landscape internal and external to the institute. Best practices and the pitfalls of indicators are continuously scrutinized and discussed. Also, the criteria and the procedures of evaluation at IIT are being made increasingly transparent and available to the scientific staff at several aggregation levels, from the researcher to the whole institute.

IIT strives for assessment criteria that enable rewarding a full range of scientific outputs, rewarding research quality and good science, ethics, integrity, and teamwork, supplemental to the established measures of research impact. In late 2022, IIT signed the "Agreement on Reforming Research Assessment", joining the Coalition for Advancing Research Assessment (CoARA), a global coalition of research funding organizations, research performing organizations, national (including ANVUR, the Italian National Agency for the Evaluation of the University and Research Systems) and regional assessment authorities and agencies together with associations of the above organizations, learned societies and other relevant organizations.

As a roadmap to fulfil the commitments and principles defined within the COalition for Advancing Research Assessment until 2027, IIT sets out its Institutional Action Plan in the present document. IIT works together with other national and international institutes to enable systemic reform to change assessment practices, maximizing the quality of research, demonstrating progresses towards this goal, implementing mutual learning, and sharing experiences, while respecting the organizations' autonomy.

Italian Institute of Technology Action plan

To fulfil the mandate of the CoARA agreement, an institutional collective effort started by the IIT Human Capital and Organization Directorate (HCOD), and the Research Organization Directorate (ROD) led to definition of the Action Plan detailed in the following. The two Directorates established a Working Group that regularly holds meetings, embracing staff members working in offices and units relevant to the tasks (Tenure Track Office, Data Analysis Office, Research Data Management and Open Science Unit, Higher Education Office, Organizational Development Office, Diversity, Inclusion and Social Impact Office, People Partner Office). The Working Group meets routinely and will implement a continuous monitoring and review of the progress of the Actions of the plan. At the basis of any further work, Action 0 was meant to stress the importance of including scientific staff and researchers, at several levels, in the activities of the Action Plan.

The IIT CoARA Action Plan to implement an advanced Research Assessment includes the following 12 Actions:

- **Action 0** – Involvement of the institutional scientific staff at different career stages in all the Actions.
- **Action 1** – Definition of institutional research evaluation principles.
- **Action 2** – Review of research evaluation criteria in assessment procedures for career paths evaluation (hiring, career development, tenure track).
- **Action 3** – Review of research evaluation criteria in assessment procedures for research groups (Site Visits, Research Units, and Research Domain evaluations).
- **Action 4** – Ensure gender equality, equal opportunities, and inclusiveness in the assessment processes.
- **Action 5** – Support Open Science and Data Management as new practices to be recognized in research assessment.
- **Action 6** – Alignment with CoARA National Chapters and Working Groups.
- **Action 7** – Development of tools, dashboards and metrics embracing the reformed assessment.
- **Action 8** – Raise awareness and enhance transparency on assessment indicators with researchers and management.
- **Action 9** – Educate the internal and external panels on the indicators used and on fair evaluation.
- **Action 10** – Provide guidance to enable effective career mentoring towards early-career researchers.
- **Action 11** – Communicate institutional decisions on evaluation processes and evaluation events.

The impact of each Action on the CoARA Commitments is detailed in the APPENDIX.

The IIT directorates and their offices involved in initiating and supporting the implementation of the Action Plan are:

ROD: Research Organization Directorate

- *DAO: Data Analysis Office*
- *RDM: Research Data Management Unit*
- *PO: Projects Office*
- *TTrO: Tenure Track Office*

HCOD: Human Capital and Organization Directorate

- *D&I: Diversity, Inclusion and Social Impact Office*
- *ODO: Organizational Development Office*
- *PPO: People Partner Office*

TT: Technology Transfer Directorate

DS: Scientific Direction

- HEO: Higher Education Office

Principal Investigators and scientific staff are going to be involved in the activities of the plan (see in particular Action 0 that foresees an active involvement in all the Actions of the Action Plan). The research groups at our institute fall into four main Research Domains (Computational Sciences, LifeTech, Nanomaterials, and Robotics).

Action 0. Involvement of the institutional scientific staff at different career stages in all the Actions

Lead/Action owner: HCOD, ROD

Type: Process

Current status at IIT - The feedback from stakeholders, in particular from the Principal Investigators, is considered when changes are made to assess research activities (e.g., including and detailing activities that are collateral to publications, like technology transfer, training modules for PhDs, dissemination events, editorship activities, ... These activities have been added in recent years to the assessment reports of research groups and researchers). However, at present the feedback and comments from researchers are received in an unstructured manner and researchers at all levels are involved only partially in this process.

Action details – To support the CoARA commitments and the Action Plan, researchers at all career stages must be involved actively. The Action is called Action 0 because it is at the basis of any other following Action. The creation of committees or associations of our researchers will drive their involvement in a structured way. This approach is going to be planned with the IIT management, starting with the Associate Directors of the institute, who are representatives and responsible for each Research Domains (Computational Sciences, LifeTech, Nanomaterials, Robotics).

Meetings and events will be organized to update and discuss with the scientific staff the aspects related to the reformed research assessment foreseen within CoARA. Mutual learning with the scientific staff will enable exchange of ideas and feedback. A methodology to identify how mutual learning is going to be implemented must be found.

Expected milestones:

1. End-2024: design the methodologies to involve and get feedback on assessing research from researchers themselves (e.g., the creation of a committee to involve researchers at different career stages).
2. End-2025: at least one round of consultations on relevant topics of the Actions performed with the researchers.
3. End-2027: any Action is discussed with the researchers, embracing their feedback in the processes the institute carries along.

Action 1. Definition of Institutional research evaluation principles

Lead/Action owner: ROD

Type: Criteria

Current status at IIT - While fair and good practices in conducting research assessments are used in many IIT evaluation processes, a formal acknowledgement of the adoption of these practices has not been made public yet.

Action details - Define and communicate publicly the IIT research evaluation principles, a general set of principles by which research evaluation and assessment processes are conducted at the Italian Institute of Technology. Adherence with the CoARA commitments, aspects from the San Francisco Declaration on Research Assessment (DORA), the Leiden Manifesto, and the latest “European Charter for Researchers” are going to be reflected in the institutional principles.

Expected milestones:

1. End-2024: Definition of the principles and approval by the Scientific Director.
2. Early-2025: publication on the IIT website/Intranet and start dissemination activities at several levels (e.g., external committees, internal panels, researchers, ...).

Action 2. Review of research evaluation criteria in assessment procedures for career paths' evaluation (hiring, career development, tenure track)

Lead/Action owner: HCOD, TTrO

Type: Criteria

Current status at IIT - IIT has adopted several evaluation criteria that already encompass various and different research outputs. However, these criteria must be constantly reviewed, updated, and formally shared with all people involved.

- IIT relies on detailed procedures for hiring and promotion of research staff processes.
- IIT organizes training activities for Principal Investigators and Directors about interviewing and selection processes.
- IIT gives trainings to PostDocs and PhDs about expertise and tools useful to their scientific career (cv writing, project proposal writing, presenting skills, ...).

Action details - In general, the offices involved plan to continue with the already existing training and formative activities offered to scientific and administrative staff. Improvements to the hiring and evaluation processes will be implemented as:

- Revision and adaptation of selecting, hiring and career evaluation of IIT scientific staff procedures, fitting the recommendation from the EU, other agencies, and our institutional principles for research assessment (see Action 1).
- Improve the way feedback is provided to all the applicants.
- Enhance transparency on job posts, contractual information, salaries according also to the European Council recommendations.

The activity of this Action should also include the revision of evaluation packages and documentation templates so that more aspects of the activity of a researcher can be detailed and explained and can be ready for qualitative evaluation (e.g., leadership roles, international collaboration, mentoring, ... thus being compliant with Action 1, Action 9 and Action 10).

Expected milestones:

1. End-2025: review of selection, hiring and career evaluation procedures.
2. End-2026: raise awareness on the opportunities for career development, enhancing transparency.
3. End-2027: support the feedback system for the applicants and the training of evaluators and panels, involving training events for any kind of staff involved in hiring processes.

Risks and mitigation: to prevent refusal of the adoption of new evaluation practices and procedures by individual staff members, their importance is going to be stressed and explained clearly.

Action 3. Review of research evaluation criteria in assessment procedures for research groups (Site Visits, Research Units, and Research Domain evaluations)

Lead/Action owner: TTrO

Type: Criteria

Current status at IIT - IIT has adopted several evaluation criteria, reflected in its evaluation documents' templates, that already encompass various and diverse research outputs. However, these criteria must be constantly reviewed, updated, and formally shared with the people involved.

Action details – Assessment procedures and evaluation packages and documentation templates will be updated, also after interacting with internal and external panels of evaluators: in this way more and more aspects of the overarching activity of the research groups can be detailed, explained, and made ready for qualitative evaluation (e.g., adherence of the results with the IIT Strategic plan, innovation, social and economic value of research, international collaboration, visibility, ...).

Expected milestones:

1. End-2025: define new criteria specific for research groups' assessments in general and check their measurability.
2. End-2026: update templates according to new criteria and share them with the scientific staff, assessment committees and panels (see also Action 9).

Action 4. Ensure gender equality, equal opportunities and inclusiveness in the assessment processes

Lead/Action owner: D&I

Type: Process

Current status at IIT - In IIT, a Gender Equality Plan (GEP) is in place to structure actions supporting gender equality, equal opportunities, and inclusiveness. In particular, the GEP section "Gender Equality in Recruitment and Career Progression" specifies strategies to promote processes to favour and support gender-sensitive recruitment, career development and appointments. With respect to this Action, the GEP annual report shows that in IIT there are gender gaps in the composition of evaluation committees, which are partly attributable to the structural phenomenon of horizontal segregation in the STEM fields.

Action details -

- Analysis of the most common evaluation and assessment procedures adopted by IIT – action to be conducted coherently with the outcomes of Action 2 and Action 3.
- Concrete proposals for research assessment criteria and good practices that ensure equal opportunities, inclusiveness and valorisation of diversity will be advanced.
- A guideline on unconscious bias in evaluation processes will be provided to stakeholders in IIT for the definition of evaluation criteria in specific contests.
- Training modules will be made available online for evaluators at any level.
- The IIT GEP annual report will be made public with related dissemination activities to the population.
- Connections between COARA and the Nexus Project where IIT is partner will be evaluated in due course. Particularly, we will delve into matters concerning how to elaborate on the commitment of the IIT Gender Equality Plan in an intersectional and intersectoral manner.

Expected milestones:

1. Mid-2025: analyze the evaluation and assessment procedures through the lens of a D&I perspective.
2. End-2025: propose the inclusion of equal opportunities in the research assessment.
3. End-2026: develop guidelines and offer training regarding the topics of this Action to the evaluators, internal and external.

Risks and mitigation:

- Possible mitigation actions of unconscious bias will be discussed.
- With respect to training modules on bias, consider sustainable measures for evaluators (e.g., shorter training for external evaluators).

Action 5. Support Open Science and Research Data Management as new practices to be recognized in research assessment

Lead/Action owner: RDM

Type: Process

Current status at IIT - IIT has had an Open Science and Research Data Management (OS & RDM) support function since 2019. Guidelines for Open Access to Publications, Open Data (in general Open Science), and Research Data Management are published on our Intranet, and have been constantly updated to reflect global changes. Periodically, trainings, webinars, and events, especially for early-career researchers are organized and promoted. In the last years, IIT joined national and international working groups (ICDI, GO FAIR, ...) and participated in several initiatives, including European projects, for enhancing networking and cooperation. Since 2024, in parallel with the launch of the new Strategic Plan, IIT has been developing an institutional RDM strategy aimed at unlocking the full potential of Research Data as the main fuel to ML/AI-based innovative scientific approaches, including the development of new infrastructure, new policies, and novel support services.

Action details -

- Upgrade OS & RDM guidelines to a policy, accompanied by more precise and detailed operational guidance, including tools made available to researchers.
- Advise and inform competent offices on relevant OS & RDM practices and discuss how they can be tracked, monitored, and measured in assessment, e.g. by using metrics used in IIT evaluation packages.
- Communicate internally policy to scientists, by also organizing trainings and informative events about the values inspiring OS (integrity, reproducibility, efficiency), associated benefits, challenges, and pathways to openness (see also Actions 8 and 11, for raising awareness and communicate changes to researchers).
- Design and implement incentives for better management and valorization of research outputs, not just considering scientific articles (e.g., prizes, badges, etc.).

Expected milestones:

1. End-2024: release of the first policy on RDM and operational guidelines.
2. End-2025: link guidelines and policies to metrics and informative dashboards.
3. Mid-2026: follow-up and advise about the inclusion of OS & RDM practices in assessment activities.

Action 6. Alignment with CoARA National Chapters and Working Groups

Lead/Action owner: DAO, D&I

Type: Process

Current status at IIT - Since September 2023, IIT has been participating in the activities of the CoARA Italian National Chapter, participating in two Work Packages in the two following tasks: WP 1.2 “Institutional Roadmaps: alignment” to align the action plans of all the Italian institutes among them and with the CoARA commitments and WP 2.1 “Coordination and alignment with selected CoARA Working Groups” to align the institutional action plans of the member organizations with the findings of the CoARA Working Groups and provide the Working Group with feedback coming from the institutes.

IIT is also member of two CoARA Working Groups, namely “Responsible metrics and indicators” and “TIER - Towards an Inclusive Evaluation of Research.”

Action details -

- Keep participating to the works of the Italian National Chapter (specifically on the Task 1.2 and Task 2.1, to align the institutional action plans and the findings of the WGs with the CoARA commitments).
- Keep participating in the two CoARA Working Groups “Responsible metrics and indicators” and “TIER - Towards an Inclusive Evaluation of Research”.

Expected milestones:

1. End-2025: embrace in the IIT processes and tools the findings coming from the works of the CoARA WG “Responsible metrics and indicators”.
2. End 2027: embrace in the IIT processes and tools the findings from the participation to the works of the CoARA WG “TIER - Towards an Inclusive Evaluation of Research”.
3. 2024-2027: align the works with the outcomes and discussion from the Italian National Chapter to reach a higher level of uniformity with other Italian academic and research institutions.

Action 7. Development of tools, dashboards and metrics embracing the reformed assessment

Lead/Action owner: DAO

Type: Technology

Current status at IIT – In 2017, IIT released and since then extensively used its CRIS (Current Research Information System) Scientilla, that aggregates and shows to the staff the data that are available in any evaluation process (patents, projects, publications, trainings, accomplishments, ...). To enhance transparency, all researchers and IIT staff can see and edit the information used when evaluations take place (e.g., research groups' evaluations, personal and groups' MBOs, ...). Next to the usual indicators of scientific productivity, charts and indicators by gender were computed in 2023 for the first time, for the IIT Gender Equality Plan and re-assessed with yearly occurrence.

Action details - Improve the existing tools and indicators to recognize the diversity of research activities and practices. Recent collaborations with the QUEST Center for Responsible Research in Berlin and with Research Data Alliance (RDA) Working Groups go in the direction of actuating the present Action. Also, indicators related to Open Science, early knowledge and research data sharing should become part of the tools and dashboards that IIT makes available to the researchers, to give an even wider overview of the research activities. The use of open bibliographic and citation databases is going to be investigated, to achieve a responsible research evaluation that focuses on producing research metrics that adhere to the CoARA principles, that are transparent, reproducible, and based on a diversity of indicators, including technology transfer indicators. Indicators referring to Diversity and Inclusion with the aim of fostering commitment in such area are going to be improved.

Expected milestones:

1. End-2024: upgrade the new institutional CRIS (Scientilla 2.0).
2. End-2025: conduct an analysis of the aspects of research activities that are measurable, leveraging on the work of the CoARA WG "Responsible metrics and indicators".
3. Mid-2026: add to the evaluation reports new informative indicators (describing Open Science aspects, pre-prints, data sharing, D&I indicators, potentially Altmetrics, if deemed relevant). The introduction and display of the new indicators will be discussed and proposed to the management and the researchers.
4. 2024-2027: assessment of the new indicators and dashboards, sharing their content and the underlying principles with the scientific staff as identified in Action 0.

Action 8. Raise awareness and enhance transparency on assessment indicators with researchers and management

Lead/Action owner: ROD, HEO

Type: Guidance

Current status at IIT - At the level of early-career researchers, ad hoc modules deal with what indicators for research monitoring are and what metrics can be used for in evaluation processes. For PhD students, they carry credits compulsory for their progression. The opening of a new organizational unit, the Office for Higher Education (“Alta Formazione”) will expand this activity. At a different level, when individual researchers (e.g. tenure-track researchers), research groups, centres, domains of research are assessed, details of the indicators used are provided to all interested parties in a comprehensive fashion and thoroughly explained.

Action details - Seminars or events about research assessment will be provided to scientific staff (including PhDs and early-career researchers). Thus, IIT staff and researchers will get acquainted with the most common and most used indicators, on ongoing qualitative and quantitative research evaluation practices considering CoARA and a new reformed research assessment. Also, the tools and systems on which parts of the research evaluation is based will be presented during these events (e.g., the IIT Current Research Information System Scientilla, notions about databases of scholarly output and indicators, ...). The set of tools used by evaluators for different monitoring activities should be defined, structured, and made available.

Expected milestones:

1. End-2024: presentation to all scientific staff, focusing on the current state of scientometrics and research assessment in IIT and the future integration of the CoARA approach into IIT tools and systems.
2. Mid-2025 onwards: the presentation is updated, integrated into a series of lectures, and run on a regular basis.
3. End-2026: re-definition of the set of tools that are put in place by IIT for research monitoring and evaluation, shared internally at all levels.

Action 9. Educate the internal and external panels on the indicators used and on fair evaluation

Lead/Action owner: ROD, HCOD

Type: Guidance

Current status at IIT – Evaluations processes at IIT that include both internal and external members in the evaluation panels foresee an interaction with the panellists: light-weight guidelines and email exchanges are provided to panel about the indicators, documentation and reports provided to them.

Action details – Any panel should get acquainted with the research assessment principles that IIT follows and know the criteria regarding assessment and regarding research activities that IIT set for its scientific staff, to improve their interpretation. The education of panel members should follow a structured approach and involve the relevant offices. A better approach for providing guidance on these subjects is under study and it will be completed in this Action: several ways of training the panels are going to be scrutinized, looking for the best way to proceed (guidelines, short tutorials, short seminars, ...). The educational process will be bi-directional: these events will give the chance to get feedback from panellists on the evaluation packages and reports provided to them.

Expected milestones:

1. Early-2025: analyze what is the best way to instruct panel members.
2. Early-2026: provide guidance on IIT evaluation processes, evaluation principles, and the evaluation indicators used.

Action 10. Provide guidance to enable an effective career mentoring towards early-career researchers

Lead/Action owner: HCOD, HEO

Type: Guidance

Current status at IIT: – Separate mentoring activities have been piloted, with a focus respectively on early-career researchers (direct career orientation) and on senior staff in a supervisory position (mentoring guidelines).

Action details – In 2024, a consensus will be reached in relation to a) IIT guidelines to senior staff for effective mentoring, which encompasses the two aspects of written guidelines and of supervisor training; b) early-research career orientation, which will include introductory courses about research careers (including research funding – already piloted - and entrepreneurship) and a senior-to-junior staff mentoring scheme. These activities meet the recommendations regarding career development and advice declared in the latest European Charter for Researchers.

Expected milestones:

- End-2024: End-2024: mode of delivery of supervisor training agreed (involving Human Capital and Organization Office, Higher Education Office - "Alta Formazione", scientific staff, ...). Early-career training partially rolled out.
- Early-2026: Early-2026: training for both types of training.

Action 11. Communicate institutional decisions on evaluation processes and evaluation events

Lead/Action owner: ROD, HCOD

Type: Guidance

Current status at IIT – The steps regarding hiring, promotion, and renewal of the scientific staff (from PostDoc/Fellow to Principal Investigators) are detailed in policies and procedures on the institutional intranet. The Tenure Track selection procedure is detailed on the IIT public webpage. The institutional decisions with respect to changes in the evaluation processes and the definition of the criteria that are going to follow the implementation of CoARA are currently initiated but shared only with the higher Management.

Action details – The institutional decisions on research assessment activities and the indicators on which assessment relies on must be communicated internally and externally. They will eventually end up in the institutional procedures and thus made public to our scientific staff.

Internally, communication on these topics with the Associate Directors of each Research Domain will be continued (it was started in 2022), with the aim to provide and share among all staff a detailed description of the decisions on the evaluation processes on the intranet and directly accessible by all staff, with details for every kind of evaluation event that takes place at IIT.

Externally, thanks to CoARA Italian National Chapter, a mutual learning process is activated, that will facilitate the organization and the communication of the IIT decisions about evaluation.

Expected milestones:

- End-2024: start disseminating and sponsoring the IIT Action Plan and the changes that are planned for the research assessment at IIT.
- End-2025: provide description of the evaluation processes that happen internally, the indicators, metrics and tools that will be adopted process by process.
- 2025-2027: keep the dissemination about these topics ongoing to reflect the latest changes, adaptation and findings in the subject or research assessment.

APPENDIX - Table – Actions vs. CoARA Commitments

Action		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
0		x				x	x	x			x
1		x	x	x	x	x	x	x	x	x	x
2		x	x	x			x		x		
3		x	x	x			x		x		
4		x					x	x			
5		x					x	x			x
6									x	x	x
7		x		x			x	x	x		
8		x						x	x	x	
9				x	x			x			
10								x	x		
11					x			x	x	x	

Although every Action affects every Commitment, the Table shows on which commitments the Action has the higher impact.

CoARA Commitments
Better recognition of research practices

C1. Recognise the diversity of contributions to, and careers in, research in accordance with the needs and nature of the research.

C2. Base research assessment primarily on qualitative evaluation for which peer review is central, supported by responsible use of quantitative indicators.

Abandon inappropriate use of metrics

C3. Abandon inappropriate uses in research assessment of journal- and publication based metrics, in particular inappropriate uses of Journal Impact Factor (JIF) and h-index.

C4. Avoid the use of rankings of research organisations in research assessment.

Move towards new assessment criteria

C5. Commit resources to reforming research assessment as is needed to achieve the organisational changes committed to.

C6. Review and develop research assessment criteria, tools and processes.

C7. Raise awareness of research assessment reform and provide transparent communication, guidance, and training on assessment criteria and processes as well as their use.

Mutual learning and communicate progress

C8. Exchange practices and experiences to enable mutual learning within and beyond the Coalition.

C9. Communicate progress made on adherence to the Principles and implementation of the Commitments.

C10. Evaluate practices, criteria and tools based on solid evidence and the state-of-the-art in research on research and make data openly available for evidence gathering and research.