**ALMA Integrated Science Team Implementation Plan**

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# Introduction

## Purpose

This document defines the implementation plan of the Integrated Science Team for the operations phase of the ALMA Observatory. Following the successful delivery of ALMA by the trilateral ALMA Collaboration and the start of Science Operations this plan describes the set up of a strong quadrilateral team with the focus of optimizing the ALMA Science return by supporting the ALMA Observing Time Allocation process, monitoring the scientific output and performance of the Observatory and defining with the user community the long term scientific priorities for ALMA.

## Scope

This document describes the plan for the quadrilateral Integrated Science Team (IST) for the operations phase of the ALMA Observatory, its core responsibilities, management structure and interfaces within the ALMA Observatory and with the users community.

The baseline budget of the IST staff from the Executives is formed by OFF-002 and XXX (as originally described in the ALMA Operations Plan, version D [RD3]), and in Chile corresponds to the Observatory Scientist position and associated funding as considered in the operations budget.

The IST is responsible for fostering high-level community input to the ALMA Science Programme by organizing the ALMA Programme Review Committee.

The IST engages in discussions on the scientific performance and long-term perspectives of ALMA through the organization of the ALMA Science Advisory Committee and its regional sub-committees.

The IST is responsible for stimulating and monitoring the scientific use of ALMA promoting the organization of conferences and workshops as well as fostering collaborations within the ALMA scientific staff.

The IST is responsible all scientific aspects of the ALMA Development Plan from formulation of requirements through design and construction to commissioning and science verification.

The IST monitors and proposes ways to optimize the scientific productivity of ALMA, in collaboration with the Science Operations Team and the regional ARCs.

The ISTworks with the ISOPT to update the Science Portal science content in preparation for the Calls for Proposals.

## References

The following documents contain additional information and are referenced in this document.

|  |  |  |
| --- | --- | --- |
| Reference | Document title | Document ID |
|  | ALMA Operations Plan, Version D | ALMA-00.00.00.00-002-D-PLA.A |
| 1. [
 | Principles for ALMA Development Program | AEDM 2011-023-O (Rev2) |
| 1.
 | Principles of the ALMA Proposal Review Process  | Check number ??? |
| 1.
 | Regional staffing/impl plans (e.g. EASC)? | *???* |

# Definitions & Assumptions

## Definitions

1. **Construction Phase:** Defines the whole period where the Science IPT has been fully or partially funded from the ALMA construction budget. This is the period from 2001 to 31 December 2012.
2. **Operations Phase:** Defines the period starting 1 January 2013 where all of Science is fully funded from the ALMA operations budget. There is currently no time limit on when this phase will end.
3. **Integrated Science Team (IST):** The ALMA Science team for the operations phase, consisting of the **Regional ISTs** from the three Executives and the Observatory Scientist and any connected staff from the JAO. The Regional IST from each Executive is known as **IST-EA**, **IST-EU** or **IST-NA**, and the one from JAO as **IST-CL**, sometimes, if the context is clear, also just as **EA**, **EU**, **NA** or **CL**.
4. **IST Head:** The head of one of the Regional ISTs, normally the regional ALMA Programme Scientists and the JAO Observatory Scientist.
5. **IST Management:** The four IST Heads.
6. **IST Lead:** The appointed lead of the IST Management, expected to be the ALMA Observatory Scientist.
7. **ALMA Program Review Committee:** Defined in RD1 and RD2. Reviews ALMA observing proposals received in response to a regular Call for Proposal and recommends to the ALMA Director a list of scientifically ranked proposals for implementation.
8. **DDT Committee:** Reviews ALMA DDT proposals and provides a scientific recommendation to the ALMA Director
9. **ALMA Science Advisory Committee:** Defined in RD1. Provides high level scientific advice to the ALMA Board on all aspects of ALMA. The three ALMA regions also have Regional Science Advisory Committees (ANASAC in North America, EASAC in East Asia, and ESAC at ESO) that provide expert advice to the Executives and provide regional input to the ASAC discussions. Normally, the ASAC members from each region are also members of ANASAC, EASAC, or ESAC.
10. **ALMA Development Steering Committee:** Defined in RD2.

## Assumptions

1. **Offsite Operations – Science Support, Offsite Small Studies, ARPC and ASAC:** We assume that the budget lines defined in the operations plan and in the regional implementation plans for supporting the activities of the IST.
2. **Continuity of Staff:** We assume that the IST staff in the region and at JAO will be maintained in the long term.
3. **Management IPT:** MIPT has been the controlling entity for Science IPT (and all other IPTs) during construction. We assume that the ALMA Management Team, as the natural evolution of the Management IPT, will exist in operations.
4. **Science Operations IPT:** We assume that SciOps IPT will be the controlling instance for all science operations groups, including DSO and the ARCs. We further assume that the Head of SciOps IPT and Head of DSO is the same person.

# Integrated Science Team Concepts

## Core Concepts

The IST main task is to set the overall ALMA Science priorities in collaboration with the community, to constantly monitor the compliance of the observatory with the scientific expectation of the community, and to propose ways to optimize the scientific return (also in the long term) of the facility.

## IST Management

The activities of the IST are managed by the Observatory Scientist and the three regional Programme Scientists. The activities of the group are coordinated by the Observatory Scientist.

## Reporting Lines

IST Heads report directly to their immediate supervisor at their respective organization. Specifically this means:

* The JAO Observatory Scientist reports to the ALMA Director(s)
* The East Asia ALMA Programme Scientist (EA) reports to the Head of the EAASC
* The ESO ALMA Programme Scientist (EU) reports to the ESO Director for Science and the Head of the EASC
* The North American ALMA Programme Scientist (NA) reports to the Head of the NAASC

The reporting lines for the IST members in each region are defined in the regional implementation plans.

## Location of Personnel

IST staff members basically reside in their affiliate institute (Executive or external). However, it is possible that some staff work at other ISTs locations temporarily. The staff complement at each IST location is defined in the regional implementation plans.

### IST-CL Organizational Structure

IST-CL is under the management of JAO in Chile. The Observatory Scientist manages directly the activities related to the organization of the APRC and ASAC meetings; while the regional Programme Scientists organize the regional SACs and the regional Development Studies process.

### IST-EA Organizational Structure

The IST-EA consists of the EA ALMA Programme Scientist, Staff Scientists, and Postdoctoral Fellows. The Programme Scientist oversees the IST-EA activities, and reports to the Head of the EAASC.

### IST-EU Organizational Structure

The following diagram shows the reporting structure of IST-EU. The ALMA Programme Scientist and the Submm Project Scientist effort is obtained from the Directorate for Science through the ESO matrix. The ESO ALMA Instrument Scientist and the ESO ALMA Commissioning Scientist are EASC staff. These allocations may change over time.

### IST-NA Organizational Structure

To be completed.... (if we keep these)

# Tasks, Responsibilities and Staffing Requirements

## IST Management

The IST is managed and controlled by the IST Management team. Decisions are made by consensus[[1]](#footnote-1), whereby each member of IST Management makes every effort to support both the goals of his or her own Regional IST, including the goals from the local institution and the regional community, and the overarching goals of the IST and ALMA as a whole. If in doubt, the ALMA Science-driven priorities shall take preference over local interests.

The scope of responsibilities and relevant on-site and off-site budgets are defined in the ALMA Operations Plan and the EAASC, EASC and NAASC Implementation Plans. These are defined by the Executives, the ALMA Management Team and with the stakeholders in the various planning and coordination meetings.

Each region may additionally appoint a Deputy Programme Scientist, however deputies are not part of the decision making process, unless the IST Head is absent and/or has specifically nominated the deputy to act on his or her behalf on a certain topic.

The IST Management, holds monthly teleconferences to discuss important issues, share information across groups and make strategic decisions. In addition IST Management meets at least twice per year face-to-face. Video conferencing can be used as an alternative if deemed suitable.

### Administrative Support and Secretarial Duties

There is no IST wide administrative support. Each Regional Executive is assumed to provide the administrative support necessary for the IST to function effectively (purchasing, meeting organization, IT support, and similar).

### APRC and DDTC organization

The Observatory Scientist is in charge of organizing the meetings of the APRC, using the appropriate JAO budget and secretarial support. Support from the regional IST TBC. The Observatory Scientist and the Programme Scientists are ex-Officio members of the ALMA DDT Committee, which provides a scientific evaluation of the DDT proposals to the ALMA Director. The DDTC is chaired by the Observatory Scientist.

### ASAC and regional subcommittees organization

The Observatory Scientist and the regional Programme Scientists are responsible for organizing the meetings of the ASAC and the regional SACs, using JAO and Executives resources as appropriate. They work in coordination with the Chairs of the committees to set the Agendas and prepare the discussion.

### Science priorities for the ALMA Development

The Observatory Scientist chairs the ALMA Development Steering Committee and provides high-level science-driven guidance to its activities. The Observatory Scientist and the Programme Scientists define the long term scientific priority for ALMA Development in collaboration with the ASAC and in consultation with the ALMA staff and the community. This process is also informed through scientific/technical workshops and Studies funded regionally and defined under the leadership of the regional Programme Scientists. The IST can also foster and promote internal Studies and development proposals.

### Science support for ALMA Development

The IST is responsible for ensuring that all ALMA upgrades meet their scientific requirements. To achieve this, the IST will assign a Project Scientist to each hardware or software upgrade project. The Project Scientist will perform some or all of the following functions:

* formulate detailed science requirements and system specifications;
* carry out calculations or simulations of performance;work alongside the Project Manager for that project, participating in all reviews and relevant progress meetings and constantly monitoring the evolution of the project against its science requirements;
* plan astronomical tests, commissioning and science verification;
* write test scripts and user documentation;
* execute the Commissioning and Science Verification programme.

Staff for these activities will normally be included in the upgrade proposals and will have to be identified and provided by the regions or JAO, on a case by case basis.

### Monitoring the scientific productivity of ALMA

The IST is responsible for monitoring the scientific return of the ALMA observatory, including, but not exclusively, tracking the scientific publications resulting from the ALMA Observing programmes. The IST can propose implementation of new policies and procedures to optimize the scientific productivity of the observatory.

# External Interfaces

## External Reporting Lines and Escalation Paths

The IST as a whole reports to the AMT. It is the responsibility of the AMT to resolve escalation requests brought forward from any of the IST Heads and to review the working and effectiveness of the IST on a regular basis.

AMT also holds the sole authority to request and approve structural changes to the IST.

Should there be any issues that cannot be resolved by AMT, they may be further escalated to the ALMA Directors Council/ALMA Board as the final institutions to resolve these issues.

## Stakeholders

### ALMA Directors

The ALMA Directors can request from the IST to prepare and or present status, reports and plans at various meetings and review boards.

### Science Operations IPT

The Science Operations IPT (SciOps IPT) receives the outcome of the ARPC from the IST and implements the ALMA observing programme and delivers the data to the users. The SciOps IPT collaborate with the IST in defining and tracking the key scientific performance indicators for the ALMA Observatory. The SciOps IPT engages with the IST to suggest Development options and actions to improve the scientific performance of ALMA.

#### ALMA Technical and Computing IPT

The ALMA Technical and Computing teams engages in discussions with the IST to discuss possible ALMA upgrades or actions to improve the overall scientific performance of ALMA. The Technical and Computing Teams may provide support as needed to follow the activities of the ALMA Development teams.

#### ALMA Regional Centers

The three ALMA Regional Centers (ARCs) shall interface with the IST through the SciOps IPT.

1. Consensus is the group resolution when opposing parties set aside their differences and agree on a decision that is agreeable to all, even if only barely. It is not a majority vote, i.e. all members must give their consent, before a consensus can be reached. [↑](#footnote-ref-1)