

Linkages with Australian Astronomy:

ISM Surveys

- Mopra (CO, CS surveys, KSP extensions, LMC/SMC), HEAT (CI, C+)
- ASKAP 12 (GASKAP HI, OH), MWA, UTMOST (RRLs), SKA; GouldBelt Mopra (Nick T)

Radio Continuum

- MWA, UTMOST, SKA
- Deep Fields of CTA-KSP Regions, TeV Shell SNRs, TeV PWN, AGNs

Optical

- Shocked Gas Lines
- Deep Fields with Skymapper? AGN

X-rays

- E-Rosita, Astro-H surveys of CTA-KSP regions AGN

Particles

- Auger (CRs) & IceCube (PeVatrons)

Transients

- All above + A/LIGO GW triggers (new CoE?) AGNs

Theoretical HE Astro

- Optimising CTA observation targets for science impact (Gal. Cen.)

Industry Engagement (Hardware components from Australia?) LIDARs, PLATOs?

KEY SCIENCE PROJECTS

1. CTA Galactic Plane Survey
2. CTA Extragalactic Survey
3. Exploring extreme particle acceleration in the Galaxy
4. Probing DM with precision measurements of the Galactic Center
5. CTA studies on active galaxies
6. On the connection between cosmic rays and the star-formation process
7. Observations of clusters of galaxies
8. Observations of the LMC
9. Observations of the Cygnus region
10. Observation of Galactic DM dominated targets
11. Observations of transient phenomena

Some merging or down-selection to take place...

Funding now and

ARC LIEF 2015 \$465k (Adel, UNSW, ANU, USyd, UWS, Monash)

1. Si-PMs for 2-3 SST cameras (pre-production phase) ~\$350k
2. Additional camera hardware (TBD) \$30k
3. Camera commissioning \$65k
4. CTA engagement (travel, meetings) \$20k

NCRIS 2015/16 request

Items 2,3,4 above \$95k

ARC LIEF 2017+ x5 yrs (\$A/yr) application next year

1. SiPMs for production phase; yr1 only \$700k (5-6 GCT cameras)
2. GCT camera commissioning \$50k
3. CTAO fees (40kEuro/yr now) min 2% share (membership) \$80k/yr over 5yr?
4. CTA engagement \$50k (travel, meetings)
→ \$880k/\$180k/\$180k/\$180k/\$180k = \$1600k total

Approx operation costs: 15MEuro/yr/1000 scientists → 15kEuro/yr/scientist

NCRIS 2016+

As for LIEF or part thereof but NCRIS not multi-year. → ask for SiPMs only?

ARC DP (supporting CTA KSP involvements) Pre-production science 2017+

- Astrophysics focus involving smaller, specific teams, postdocs

CTA Construction Costs: What Items can we count towards This?

CTA Cost Book

Educated estimates -
but a good starting point.



Cherenkov Telescope Array
Cost Book

Ref: MAN-PLANS/140505
Version: 1.2
Date: December 11, 2014
Page: 1/44

Cherenkov Telescope Array Cost Book

Originator	Checker	Approver
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Marc-André Besel
Christopher Townsley

Key Words

Cost Book; In-Kind Contributions; In-Kind Review Committee; Remit; IKRC; IKC

List of Abbreviations

ALMA Atacama Large Millimeter Array	IKRC In-Kind review committee
CTA Cherenkov Telescope Array	MTBF Mean time between failure
CTAO Cherenkov Telescope Array Observatory	PSF Point Spread Function
R&D Research and Development	FoV Field of View
FAIR Facility for Atom and Ion Research	RoP Rules of Procedure
PBS Product Breakdown Structure	xST Collective term for 'Large-, Medium- or Small' Size Telescope
PO (The CTA) Project Office	TCO Total Cost of Ownership
WBS Work Breakdown Structure	TDR Technical Design Report
PMT Photomultiplier Tube	VLA Very Large Array
FTE Full Time Equivalent	

History

0.1	2014-05-05	Initial draft document
0.2	2014-06-19	Christopher Townsley expansion/alterations
0.3	2014-06-26	Addition of Werner Hofmann comments
1.0	2014-06-30	Approved as draft 'proof-of-principle' cost book with very preliminary cost data and sent to AFAC
1.1	2014-07-03	Minor change in figure 4 - added missing line
1.2	2014-12-11	Addition of In-Kind Review Committee appendix, addition of possible cash substitution for non-delivery requirement

Distribution CTA Administration and Finance Advisory Committee; Open*

*Some diagrams are rather small and may require magnifying on-screen to read. This was considered necessary in order to display all the information in a single location and indicate the project structure. The alternative is to print it on a3 paper. It is

CTA General Meeting (Liverpool) Sept.2015

- M. Burton, R. Crocker as backup.

CTA-Australia Outreach Representative

- Who? N. Tohill? (Email project office)

ACTION ITEMS for me (Turku CTA Meeting)

- Australian industry/hardware (LIDAR, PLATO, Low power systems)
- MWL/theory in-kind leverage of CTAO fees?
- Timing of LIEF SiPM payment for GCT cameras in 2015
- Timing of GCT CHEC-S prototype commissioning (Oct/Nov – Andrew Malouf)
- KSP Science case...
- Mopra LIEF fail....get more CTA support for Mopra LIEF retry?

ACTION ITEMS NOW

- KSP internal pages edit rights – **KSPs now closed → See CTAScienceCase.pdf**
- Telecon after Turku, every 3months?
- Expectation of Australia's share 2% (with letter to upgrade Party status)