Milky Way Magnetic Field Mapping Mission

M4 Management Issues, Structure, Plan

Dan Clemens

Institute for Astrophysical Research (IAR)

Boston University

Outline

- Management Functions
- M4 Management Challenges
- Lessons Learned
- A Draft Management Plan
- M4 Science & Operations Center
- Science Dollars left after M4 construction
- Identifying Key Personnel

Management Functions

- Assume overall Project responsibility (PI function)
  - including recommending termination if science objectives cannot be met within cost/schedule reserves.
- Provide oversight of all units, subcontracts
- Develop, maintain schedule
- Monitor, control cost
- Conduct reviews
- Issue reports (cost,schedule, performance, failure, …)
- Plan, Manage, and Mitigate risk

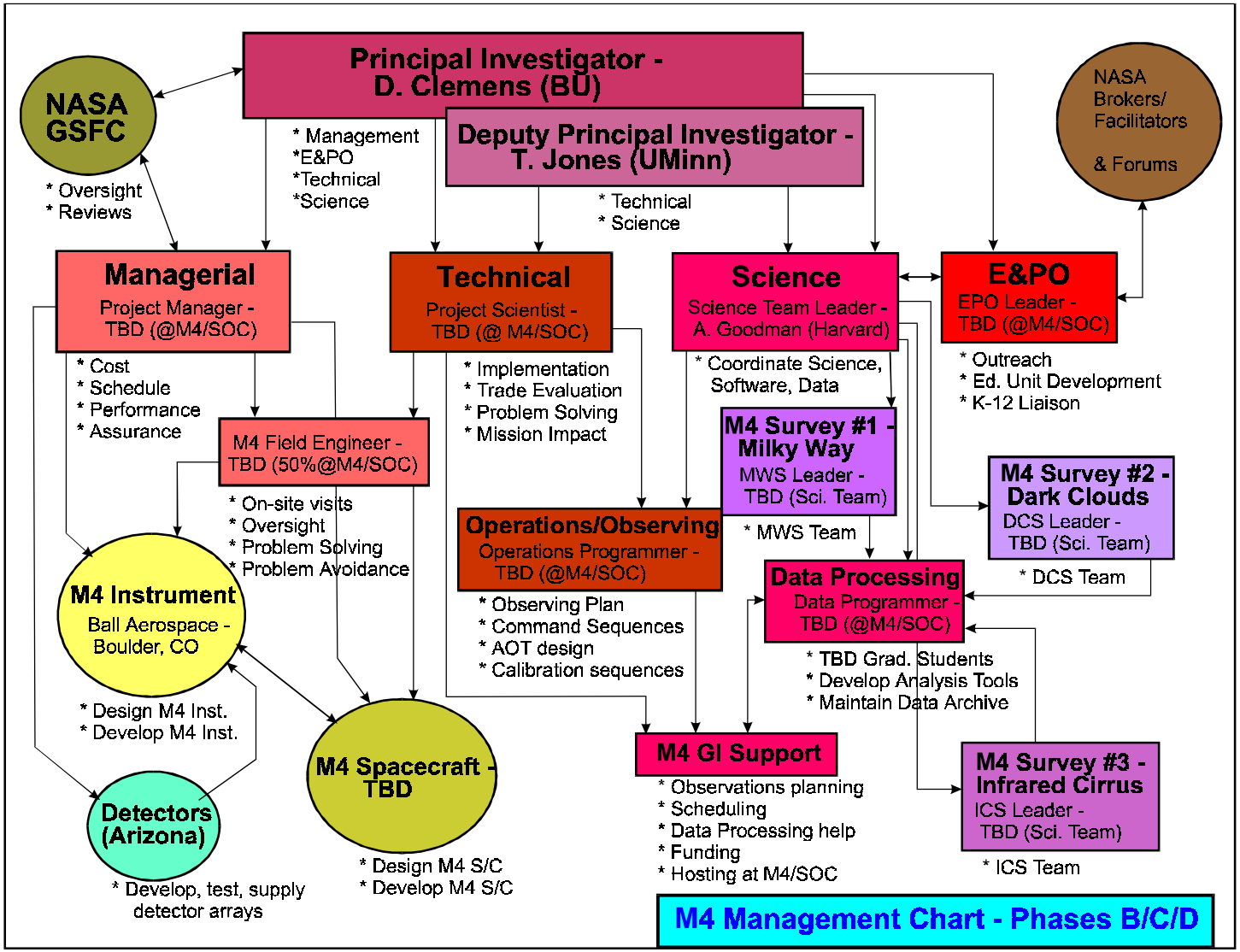
M4 Management Challenges

- M4 Instrument and S/C will both be subcontracts
  - large subcontracts! (~80% of non-rocket costs)
  - how best to oversee Ball and other contractors?
    - avoiding problems
    - solving problems
    - ensuring good communication
- Minimal experience with large project management
  - how best to borrow or buy good management experience?
  - how best to train key personnel?
- Cost control
  - instrument & S/C performance and features
    - which are required? which not?
  - reserve and margin management policy & implementation?
  - preserving MO&DA
    - at “all costs”?
    - priority ranking of MO&DA item value

Lessons Learned

- PIREX and M4/1997 were management challenged.
- PI role in M4/97 was excessively central
  - more delegation necessary
  - more distribution of functions through entire M4 organization needed
- Lean management necessary
  - SWAS model will not work with $$ we have to spend
    - large operations staff
    - long mission lifetime

M4 Draft Management Chart



M4 Science & Operations Center

- Phase A
  - Concept Design
  - Concept Study Report
  - 2 FTE's (PI + PM)
- Phase B/C/D
  - Preliminary Design Oversight
  - Detailed Design Oversight, Data processing & operations development
  - Development Oversight, flight scheduling, testing
  - PI/DPI (DPC part time; TJJ visits, telecons)
  - Management (PM + Field Engineer)
  - Technical (PS + Programmer#1)
  - Science (Science Lead [AG] + Programmer#2)
  - E&PO (EPO Lead)
  - 6 FTE's, 2 PT, graduate+UG students

M4 Science & Operations Center II

- Phase E
  - PI/DPI (both full time during flight; part time after flight)
  - PM, FE released after flight
  - PS leads day-to-day SOC activities
  - 5 FTE's during flight, 3 FTE's after flight, + grad&UG students

Science Dollars left after M4 construction

- Total ~9M$ in MO&DA rough budget
- M4/SOC
  - Phase B/C/D cost ~ 2M$ (3yrs @ 5 FTE's ave + hardware)
  - Phase E cost ~ 1.5M$ (4 yrs @ 3 FTE's + travel)
- GI Program
  - 1.3M$ (15 investigations)
- E&PO
  - 0.8M$ (1.6%)
- Science Team
  - 3.4M$ (~12 groups @ 0.75 postdocs for 3 years)

Identifying Key Personnel

- Project Manager
- Field Engineer
- Project Scientist
- Operations/Observing Programmer
- Data Processing Programmer
- E&PO Leader
- M4 Survey Leaders
  - MWS Leader
  - DCS Leader
  - ICS Leader
- M4 Survey Teams
  - MWS Team
  - DCS Team
  - ICS Team