Pre-proposal Workshop

March 17-18, 2015
Tucson, Arizona

NASA Insight/Oversight

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Extreme Precision Doppler Spectrometer (EPDS)
on the WIYN 3.5 m Observatory
CL#15-1184

Outline

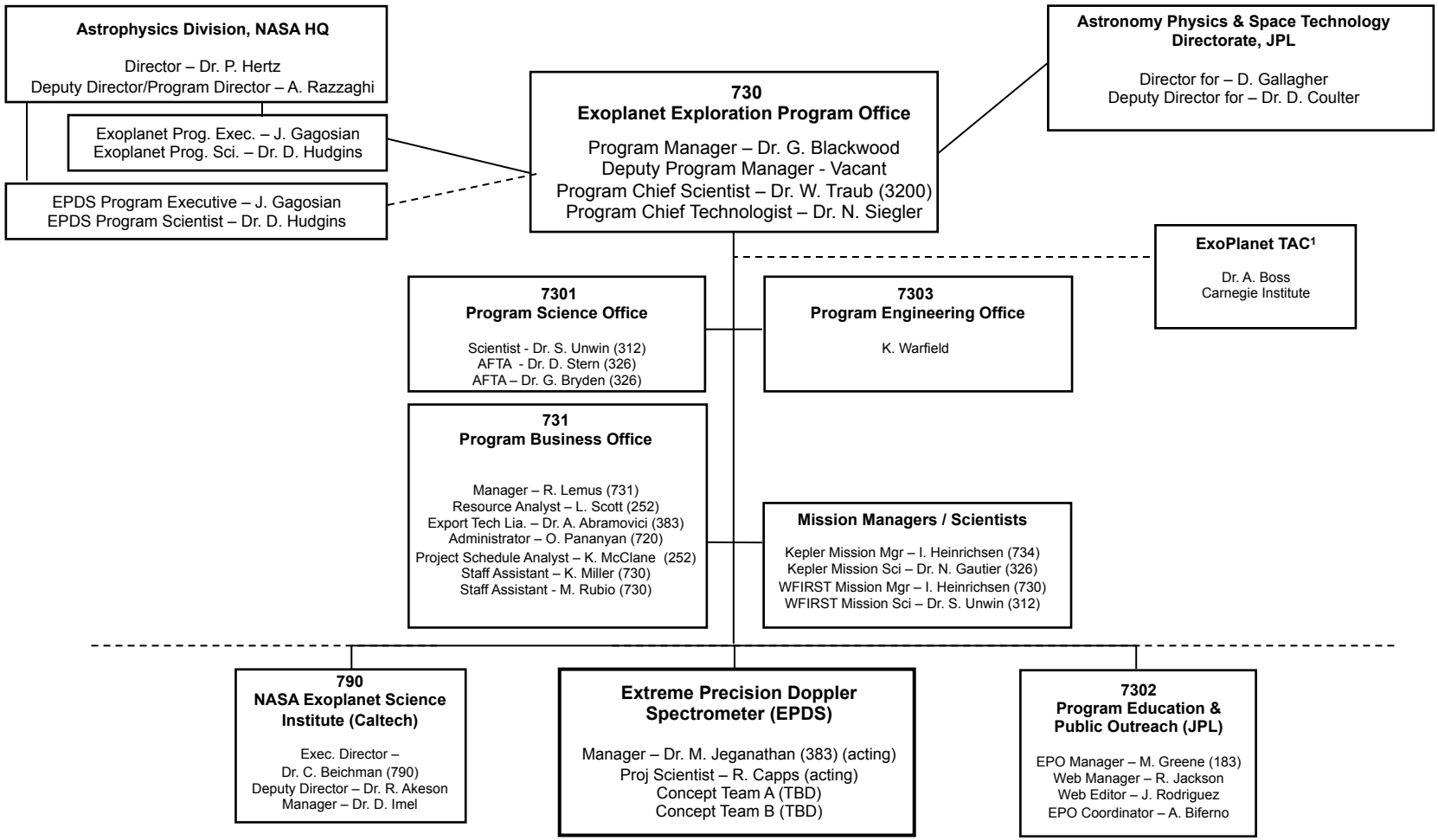
- Project Organization
- PM & PS roles and responsibilities
- Project reporting expectations

Instrument Concept Study (ICS) deliverables

- Requirements & Interface Review
- Instrument Concept Review
- Instrument Summary Presentation to NASA HQ

- What can the proposing team expect from the PM (or how can the PM assist the implementing team?)

EPDS Development Managed by ExEPO



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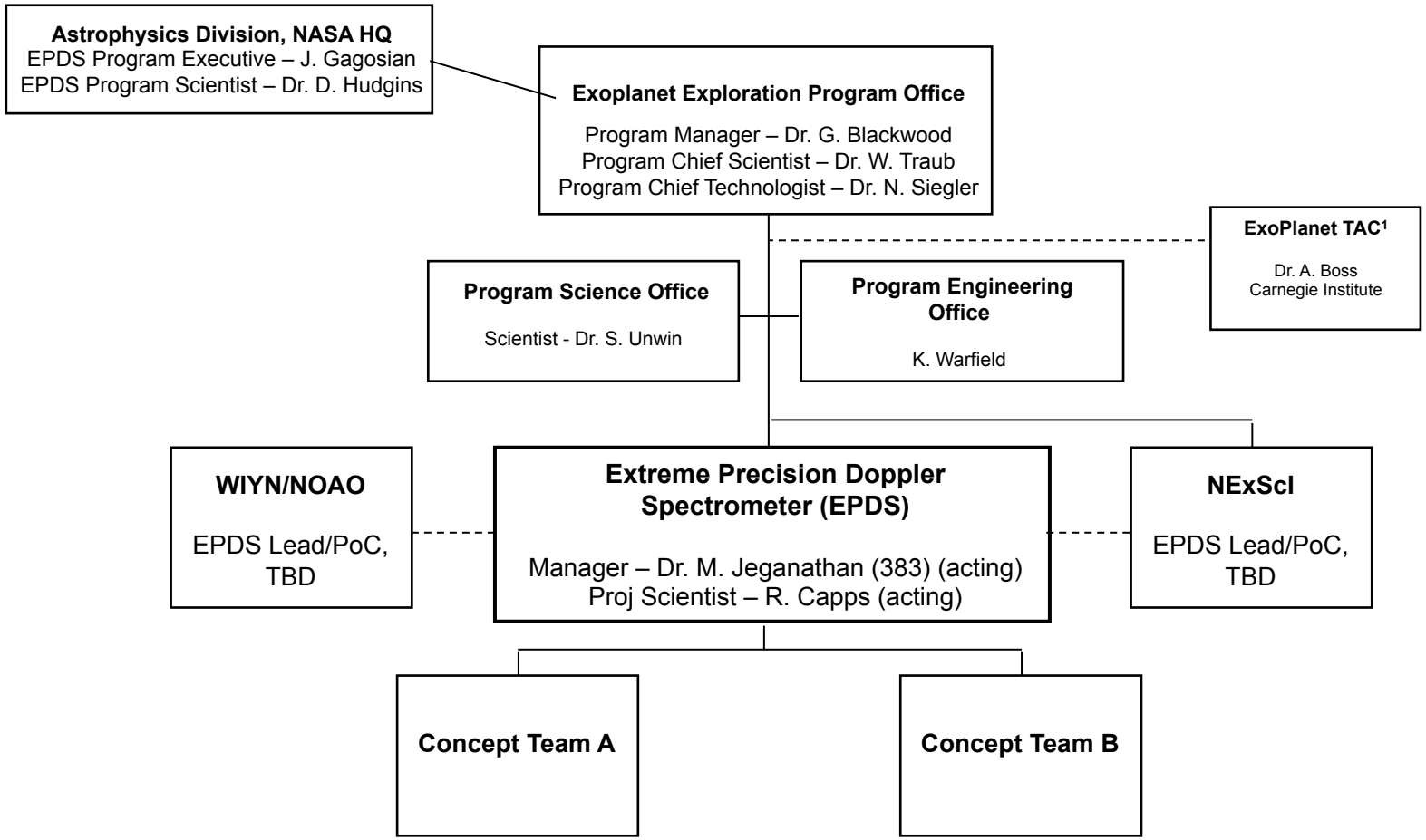


Insight/Oversight Provided by PM/PS

- Project Manager
  - Ensures project success – delivering on performance, cost and schedule
  - Liaison between project at implementing institution and ExEPO, NASA, NOAO and NExScI
  - Contract Technical Manager (CTM) of the subcontract from JPL to the implementing institution

- Project Scientist
  - Ensures the scientific integrity and overall scientific success
  - Represents the Scientific Investigators to the Project, NASA, NOAO and WIYN
  - Scientific spokesperson for the Project

- Approximately half-time equivalent for each

What is expected in the Step 2 proposal?

- See ROSES-2014 NRA for NASA requirements
- Team and organization
  - Experience
  - Roles & responsibilities
  - Communication, coordination and decision making
  - Work breakdown structure
- Management Process
  - Technical – scope/deliverables, key metrics and margins
  - Cost and schedule management – slack, descopes, significant procurements/subcontracts
  - Risks – top risks & their mitigation
  - Safety & quality assurance – internal reviews, documentation, configuration management

Expectation during ICS & Development

• Tag-up on status, progress & issues	<1 hr, Weekly 
• Tag-up with NASA HQ	30 min, biweekly 
• Schedule tag-ups	30 min, biweekly 
• Project Management Reviews (PMR) at implementing institution	2-3 hrs, Every 6 wks + written report 
• Major reviews during ICS	
• Requirements & Interface Review	4 hrs, (Sep/Oct 2015) 
• Instrument Concept Review	8 hrs, January 2016 
Both at implementing institution	
• ICS Summary Presentation to NASA	1 hr, Jan/Feb 2016 
• PI & PM at Washington, DC	

No travel to JPL is expected

Instrument Concept Study (ICS)

- Six month (maximum) duration – Aug 2015 to Jan 2016
- Early (first) progress review emphasizing an understanding of requirements
  - Requirements & Interface Review
- Final (second) review of the instrument's preliminary design and implementation plan (schedule, cost, and risks)
  - Instrument Concept Review (ICR)

- Instrument development will be treated as a Research and Technology (R&T) project under NPR 7120.8

Requirements/Interface Review - 1

- Deliverables
- Level 1 requirements / success criteria and their verification
- Performance Requirements
  - Level 2 (Level 3) requirements flow down
  - Key & driving requirements and their verification approach
  - Assess completeness and adequacy of requirements
  - Science, experiment and instrument performance models
  - Key metrics along with error budgets, current best estimates, uncertainties and assumptions
- Interface Requirements
  - Documentation of Optical, Mechanical, Environmental, Electrical, Software & Data interfaces

Requirements/Interface Review - 2

- Instrument Description
  - Requirements, block diagram & architecture
  - Description & build approach – what's new, inherited, procured
  - Performance capabilities and margins
  - Technical resources, uncertainties
  - Assumptions and risks
  - Integration and test concept
  - Calibration requirements and concept
- Operations and Data Management
  - Operational requirements
  - Pipeline processing requirements and concept
  - Levels 1-2 product description, data rate/volume & processing needs
  - Data interface to WIYN and NExScI

ICR Scope - 1

- Project
  - Deliverables
  - Level 1 requirements / success criteria
  - Team organization – roles & responsibilities, org chart
  - Top-level schedule showing key milestones and critical path
  - Key metrics along with current best estimates, contingencies and margins
  - Key challenges, interfaces, constraints
  - Facility (including major support equipment) requirements
  - Status of action items (response to findings) from Req. Review
  - Status of MOUs and agreements, if any
  - Configuration management approach & plan

  With emphasis on changes since Requirements Review

ICR Scope - 2

- Systems Engineering
  - Performance Requirements
    - Level 2 (Level 3) requirements flow down
    - Key & driving requirements and their verification approach
    - Requirements compliance check
  - Interface Requirements
    - Optical, Mechanical, Environmental, Electrical, Software, Data ICDs and status
  - Verification of Level 1 requirements
  - Results of major design trade-offs; outstanding trades, if any
  - Status of risk reduction hardware and testbeds, if any
  - Risk management process, risk list & mitigations
  - Descopes and decision date, if any
  - Project document tree and documentation plan
  - Drawing tree

ICR Scope - 3

- Science
  - Science, experiment and instrument performance models
  - Error budgets for key parameters
  - Calibration plan
  - Changes since Requirements Review

- Instrument
  - Requirements, block diagram & architecture
  - Changes since Requirements Review;
  - Description & build approach – what's new, inherited, procured
  - Long lead procurement and status
  - Performance capabilities and margins
  - Technical resources, contingencies and margins
  - Integration and test concept
  - Requirements verification plan

ICR Scope - 4

- Operations and Data Management
  - Operational requirements, modes & scenarios
  - Pipeline processing algorithms
  - Levels 0-2 product description, data rate/volume & processing needs
  - Data interface to WIYN and NExScI

- Safety & Quality Assurance
  - NASA, JPL, Institutional and Project requirements
  - Environmental requirements along with design, analysis and test plan
  - Instrument life assessment – life limiting elements & spares, time to recover from failures
  - Servicing and maintenance concept

ICR Scope - 5

- Path to completion of detailed design
- End-to-end I&T + verification plan (photons to RV)
- Preliminary commissioning plan

- Detailed Schedule
- Detailed Cost
  - Basis of estimate
  - Cost breakdown by WBS, month, phase

Development Focus

Product	At Req. Rev	At ICR	At CDR	At SIR
L1 Requirements / success criteria (PLRA)	Final			
L2-L3 requirements	Preliminary	Under change control	Final	
Interface Requirements	Preliminary	Under change control	Under change control	Under change control
Performance models & error budget	Preliminary	Detailed	Refined	As built performance
Instrument design/build	Conceptual	Preliminary	Drawings	Parts built
Integration & test (I&T)	Conceptual	Preliminary	Plan	Procedures
Verification & validation (V&V)	L1 approach	L1 & L2 plan	L1-L3 plan	Procedures
Pipeline	Proof-of-concept	Approach	Algorithms	Code

CDR = Critical Design Review SIR: System Integration Review

ICS Presentation

• Teams deliver ICS presentation material	Late-January
• Teams present the material to the Review board	Mid-February (8 hrs)
• Teams present summary of their concept to Paul Hertz/HQ.	Early-March (30 min each)
Review board presents summary of their findings/recommendations to Paul Hertz/HQ	(1 hr)
• Paul Hertz/HQ announce selection	Mid-March

PM: Ensures Project Success

- Assist the implementing team to increase likelihood of project success – delivering on performance, cost and schedule
  - Performance via sound Systems Engineering
    - Support requirements flowdown
    - Assist in building performance models and error budgets
    - Lead risk management
  - Cost & schedule control
    - Assess progress vs plan, take corrective actions
    - Document liens to Program Office
  - Safety and quality assurance
    - Ensure design, analysis, build and testing meet relevant standards and are documented; configuration is managed
    - Hold comprehensive project reviews
  - Initiate "tiger teams" to address specific problems
    - Employ JPL expertise where needed

PM: Liaison to ExEPO & NASA

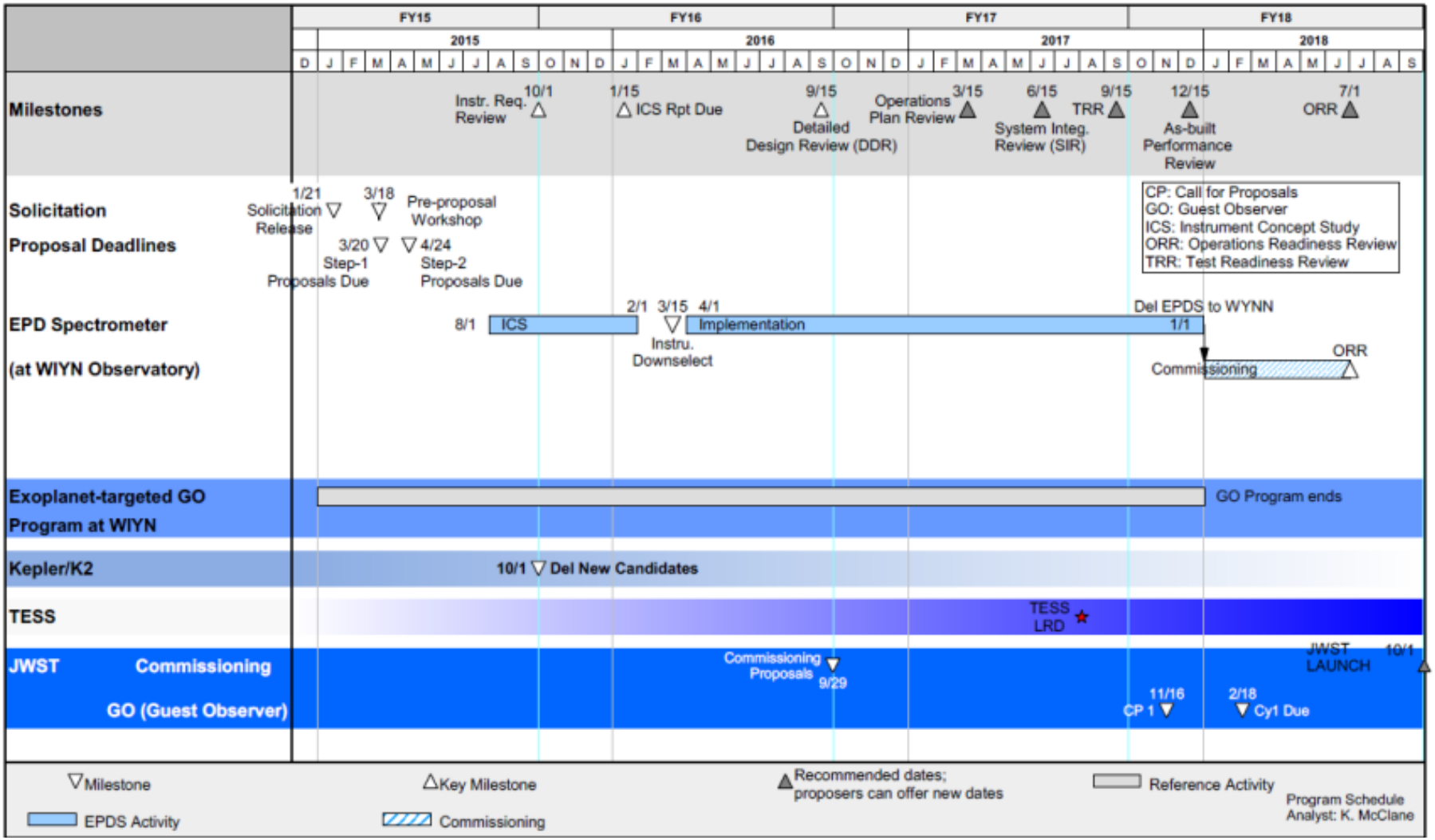
- Reduces reporting burden on implementing team. With support from PS, provides
  - Inputs to weekly significant events
  - Inputs to monthly program status review (PSR)
  - Inputs to quarterly status reviews (QSRs)
  - Inputs to PPBE – NASA budget cycle
- Organize all project reviews
- Communicate NASA/ExEPO priorities, budget profile, etc.
- Independently assesses impact of Project decisions (descopes), risks and status on science (L1 requirements)

PM: Contract Technical Manager

- Instrument development at selected institution through subcontract from JPL
- As the JPL CTM, the PM assists with all contractual issues
  - Authorizing funding on an incremental basis – every 3-6 months
  - Approve certain procurements
  - Resolve disposition of any work that fails to comply with subcontract requirements

Backups

Schecule


FY15
FY16
FY17
FY18
2015
2016
2017
2018
D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S
Milestones
Instr. Req. Review 10/1
1/15 ICS Rpt Due
9/15 Detailed Design Review (DDR)
Operations Plan Review 3/15
6/15 System Integ. Review (SIR)
TRR 9/15
12/15 As-built Performance Review
ORR 7/1
Solicitation
Proposal Deadlines
1/21 Solicitation Release
3/18 Pre-proposal Workshop
3/20 Step-1 Proposals Due
4/24 Step-2 Proposals Due
CP: Call for Proposals
GO: Guest Observer
ICS: Instrument Concept Study
ORR: Operations Readiness Review
TRR: Test Readiness Review
EPD Spectrometer
(at WIYN Observatory)
8/1 ICS
2/1 3/15 4/1 Instru. Downselect
Implementation
Del EPDS to WYNN 1/1
Commissioning
ORR
Exoplanet-targeted GO Program at WIYN
GO Program ends
Kepler/K2
10/1 Del New Candidates
TESS
TESS LRD
JWST Commissioning
GO (Guest Observer)
Commissioning Proposals 9/29
11/16 CP 1
2/18 Cy1 Due
JWST LAUNCH 10/1
Milestone
Key Milestone
Recommended dates; proposers can offer new dates
Reference Activity
EPDS Activity
Commissioning
Program Schedule Analyst: K. McClane