

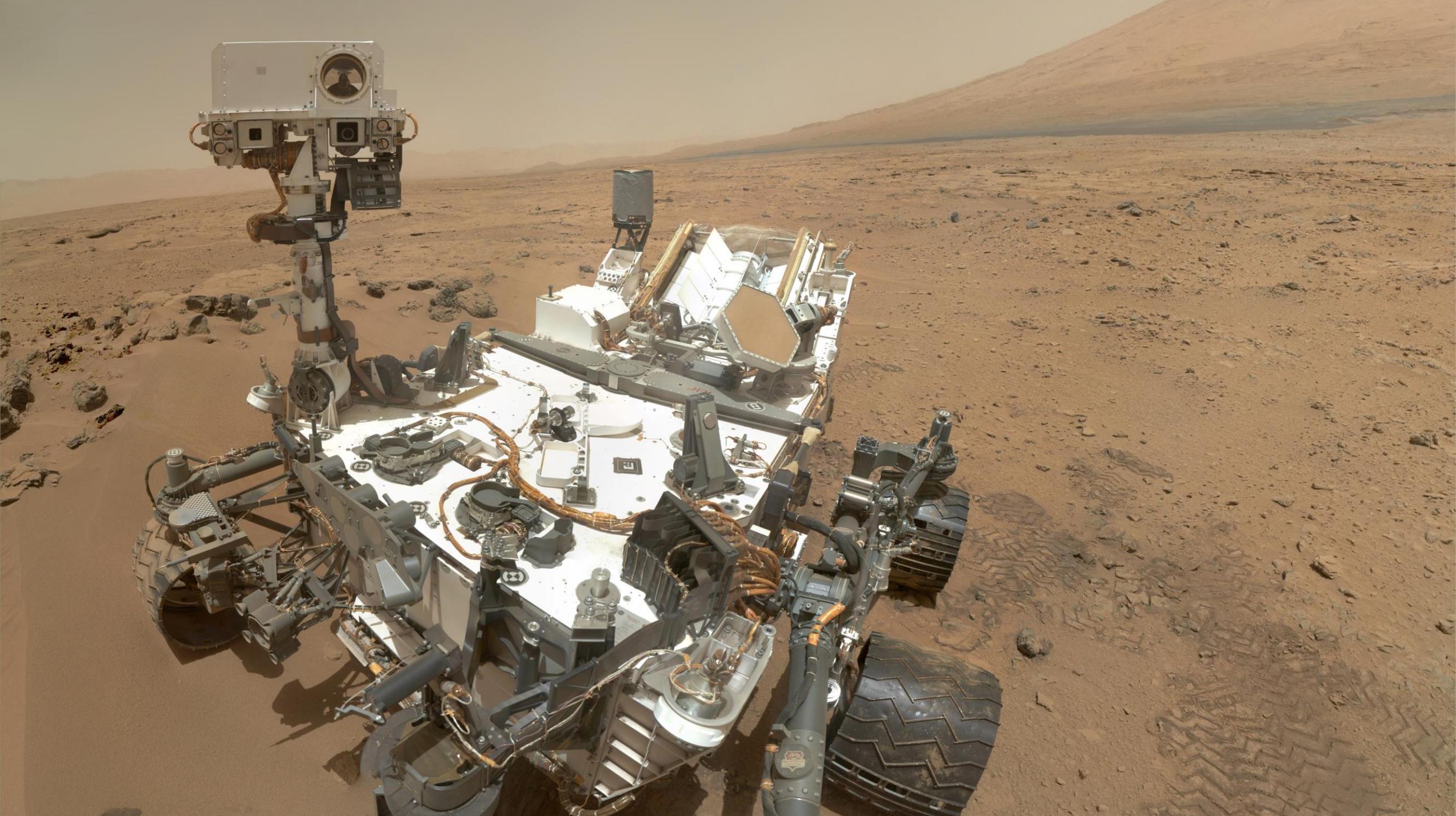


Managing Change in JPL's Highly Innovative Environment

Teamcenter Connection
May 10th, 9:00 AM

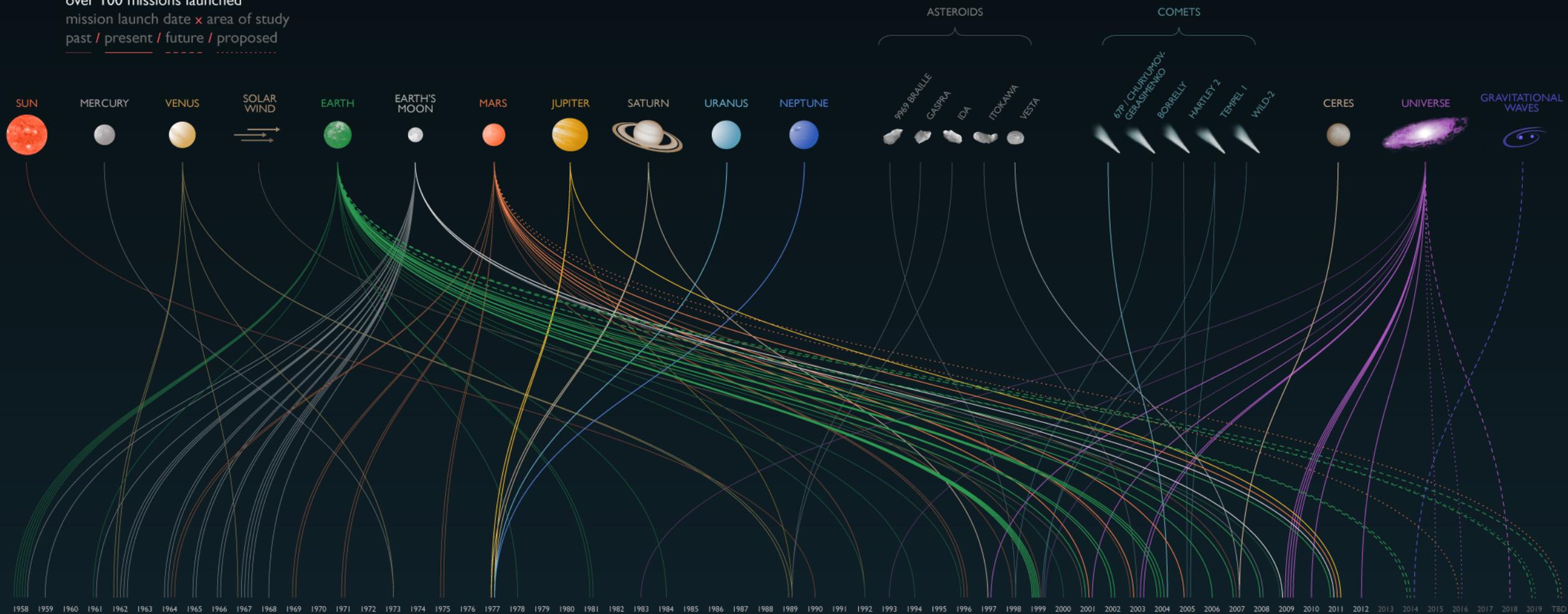
Chris Bleill
Craig Poulson





JPL MISSION HISTORY

over 100 missions launched
mission launch date x area of study
past / present / future / proposed



PLM TOOL HISTORY @ JPL

Custom Systems (Pre-1995)

Sherpa (1995-2006)

Teamcenter Enterprise (2003-Present)

Teamcenter Engineering (2003-2014)

Teamcenter UA (2014 – Present)



MRO

PERIAPSIS: 170km
OPTICAL NAV

KA-BAND
524 Kbps

XBAND
RECEIVE

ELECTRA
UHF

USERS

- CAD Designers
- Analysts
- Configuration Mgmt.
- Subcontractors

PROCESSES

- Design Release
- Document Release
- Change Mgmt.
- Waiver/Deviation

DATA

- Designs
- CAD Models
- Other misc types
(Doc, JT, Zip, Txt)

- MCS
- HiRISE
- CRISM
- CTX
- MARCI

SHARAD PROBE

HORIZ (Km) 1.30
VERT (m) 6.29

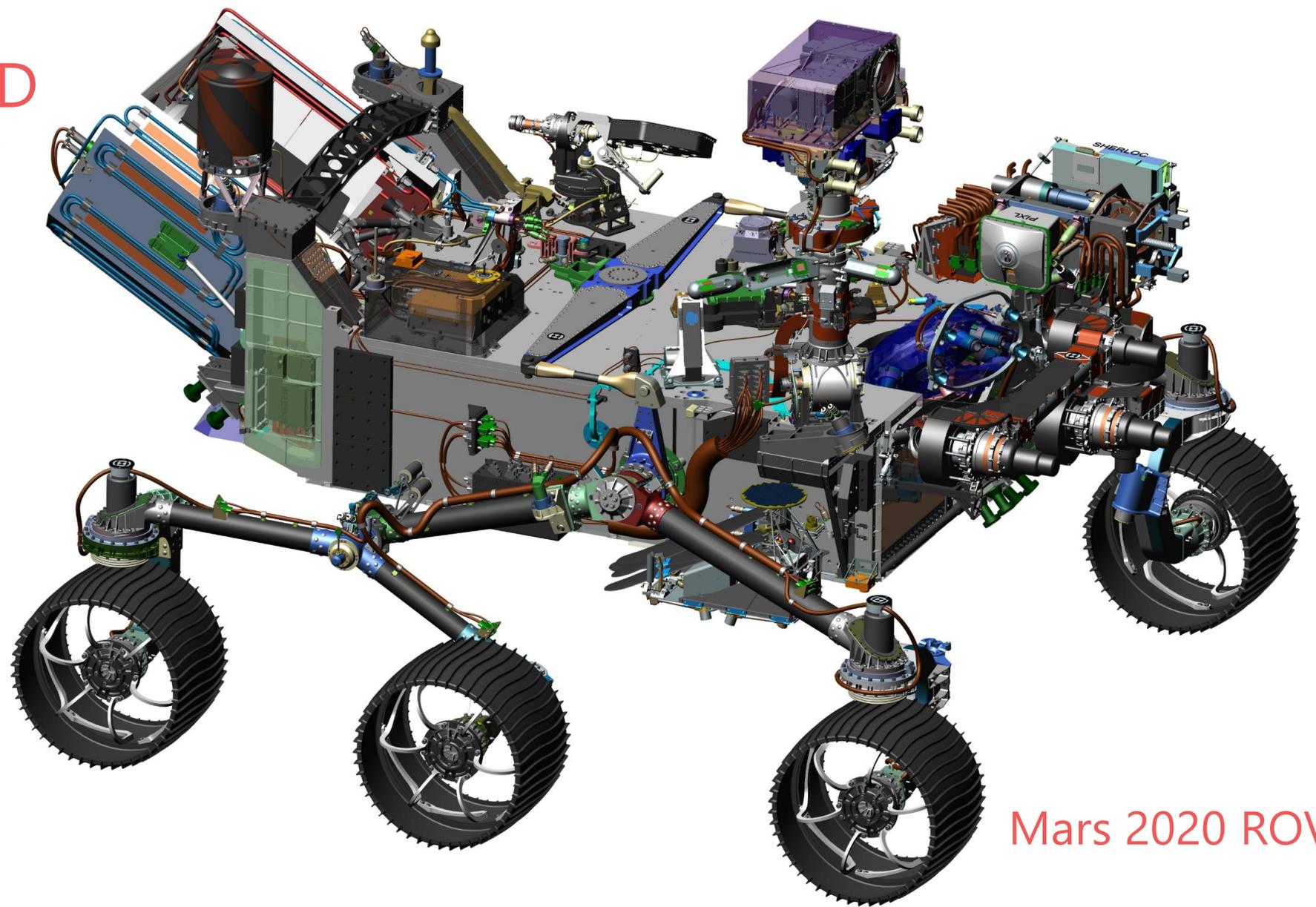
010 008 006 004 002 000 002 004 006 008 010

THE WILD, WILD WEST





WHAT CHANGED
WITH CHANGE?



Mars 2020 ROVER



CHANGE MANAGEMENT REQUIREMENTS

1. Flexible to meet different project standards
2. Capture data points as properties
3. Manage action items
4. Manage unincorporated ("hanging") change



CHANGE MANAGEMENT OBJECTS

1. Engineering Change Request (ECR)
2. Engineering Change Notice (ECN)
 - Type = ECN (Pending Changes and Action Items)
 - Type = ECO (Unincorporated Changes)



ENGINEERING CHANGE REQUEST

1. Lots of custom properties
 - Severity and cause
 - Affected item scope
2. Financial Information (Liens)



ENGINEERING CHANGE NOTICE

Type – ECN

- ✓ Used to track action items
- ✓ Must be closed before ECR
- ✓ 1:1 with Affected Items
- ✓ Usually managed by CME

Type – ECO

- ✓ Used to track hanging change
- ✓ May stay open after ECR
- ✓ 1:1 with Affected Items
- ✓ Requires Engineering Approval



Liens (Budget Change)

1. Account information (From – To)
2. 10 years of fiscal impact
3. Soft (Proposed) and Hard (Actual)
4. ECR to Liens is 1:M Cardinality



POSSIBLE PATHS OF CHANGE



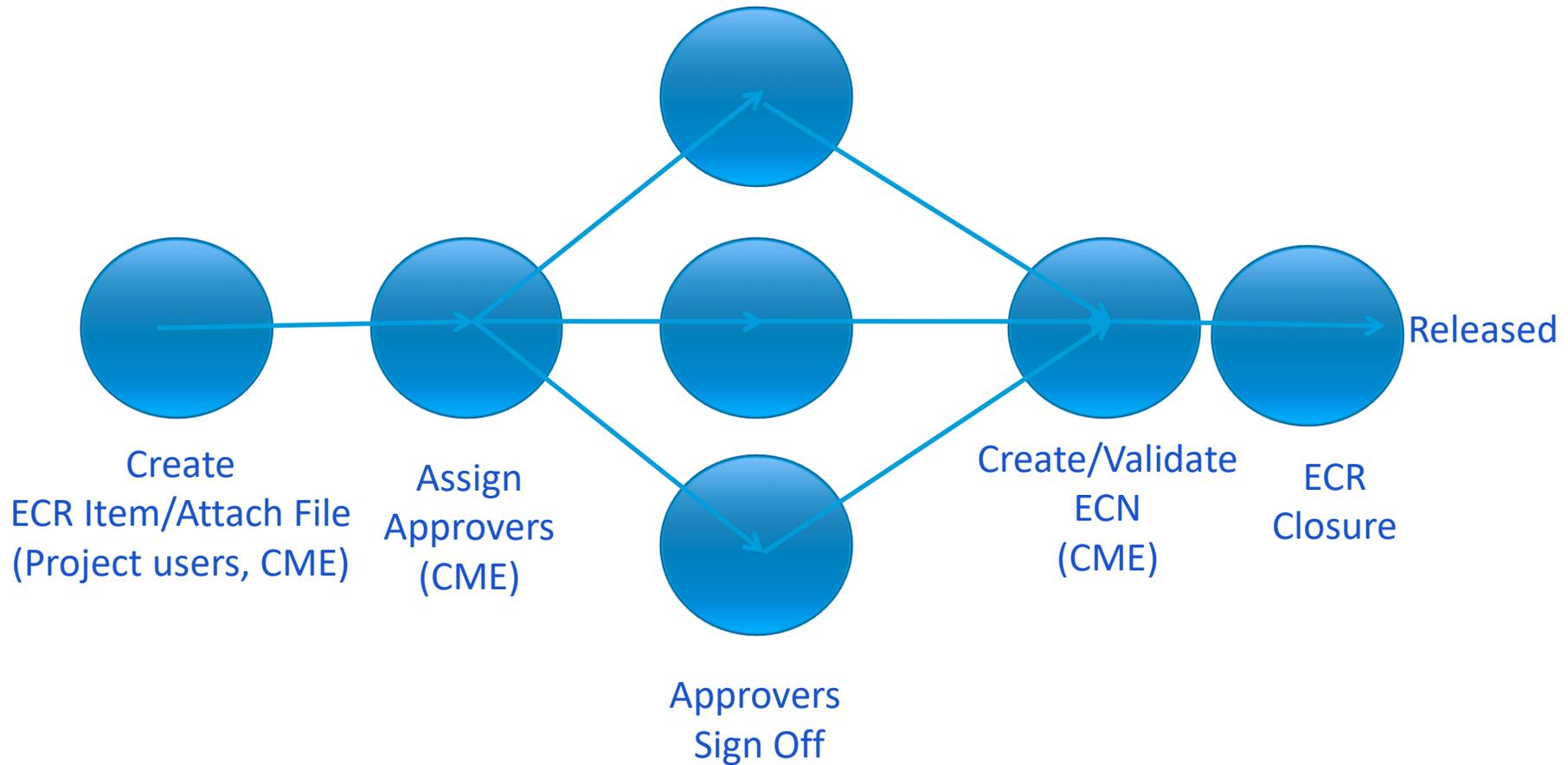


EXAMPLE

Item/Revision	Model/Revision
I2345678-I, A	I2345678-I, A
I2345678-I, B	I2345678-I, B
I2345678-B-ECO001 I2345678-B-ECO002 I2345678-B-ECO003	← "Approved for use/incorporation" ECO's
I2345678-I, C (Clean <u>dwg</u> attached)	I2345678-I, C
ECN03456 (from ECR) I2345678-C- ECO001	← "Waiting for Incorporation" ECN
I2345678-I, D (Clean <u>dwg</u> attached)	I2345678-I, D



PROCESS FLOW - ECR





SCREEN SHOT - ECN

The screenshot displays the Siemens Teamcenter interface for an Engineering Change Notice (ECN). The main window title is "My Teamcenter (Bleill,Chris (cmbleill) - CM and IM/ CME - [EPDMUAT] [] [] [])". The ECN details are as follows:

- Item:** ECN01230/- (ECN)-Change Rover wheels from round to square
- Date Created:** 23-Apr-2017 14:37
- Status:** JPL Change Notice Revision
- Type:** JPL Change Notice Revision
- Release Date:** (blank)

The interface includes several tabs: Overview, Signoffs, and Audit Logs. The Overview tab is active, showing the following sections:

- ECN Properties:**
 - Item: ECN01230-Change Rover wheels from round to square
 - ECN Number: ECN01230
 - Revision: -
 - Change Title: Change Rover wheels from round to square
 - Change Notice Type: ECN
 - Description: N/A
 - Organization: JET PROPULSION LAB (23835)
 - Reference Designators: (blank)
 - Project IDs: M2020
- ECN Participants:**
 - Requestor: CM and IM/CME/Bleill,Chris
 - Cog E: (blank)
 - Configuration Management Engineer (CME): Bleill,Chris
 - Document Approvers: (blank)
 - Elaborator(Author or Designer): (blank)
 - PDM: (blank)
 - Follow Up Engineer: Bleill,Chris
 - Release Notification List: (blank)
- Other ECN Properties:**
 - Change Reason: Design/Risk Improvement
 - Was: Round
 - Is: Square
 - CCB Closure Actions: (blank)
 - Notes: (blank)
 - Comments: (blank)
 - Owning COG-E: (blank)
 - Owning Designer: (blank)

On the right side, there are sections for Project Actions, Workflow Actions, Other Actions, Primary Files, Supporting Files, Implements ECR(s), Impacted Documents/Designs, and Solution Documents/Designs. The Primary Files section shows a file named "square-wheel.jpg" with a status of "In Review" and a last modified date of "23-Apr-2017 14:54". The Implements ECR(s) section shows a table with one entry:

Object	Status
200631/- (ECR)-Change Rover wheels from round to square	In Review

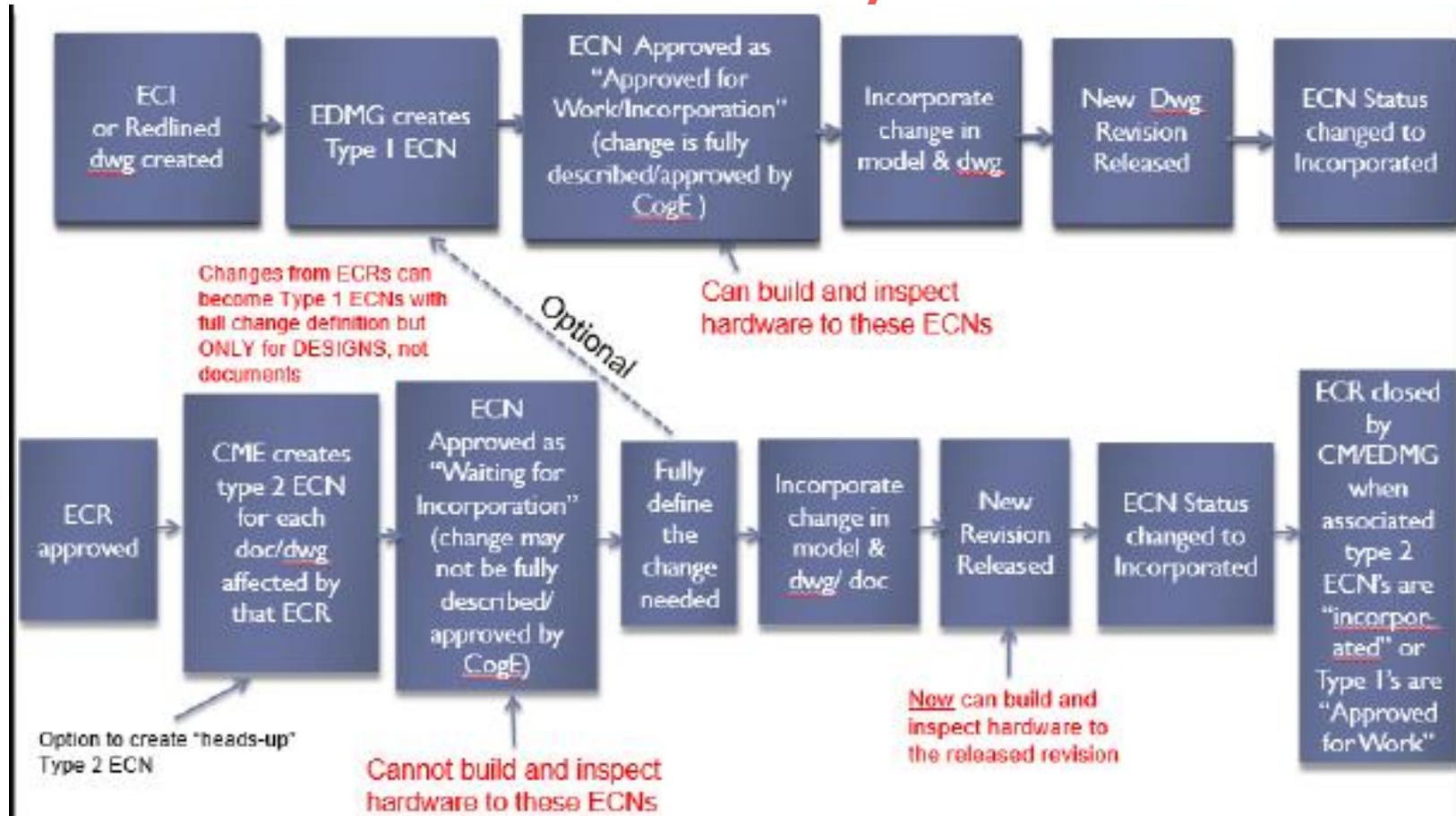
The Impacted Documents/Designs section shows a table with one entry:

Object	Revision	Name
AUTO-00071097/A1-Round Wheel Design	A1	Round Wheel De

The Solution Documents/Designs section shows an empty table with columns: Object, Revision, Name, Status, Reference Designators, Owner.



PROCESS FLOW – ECN / ECO





FAQs

1. How do I know if there is an ECN/ECO against my design?
2. Do I have to incorporate *all* hanging change into my next revision?
3. How many ECO's can we "stack"?



FEEDBACK

- “ECO’s a great way to document redlines and show how many times we have modified a design since the last full revision” – Mars 2020 CME
- The “ECN Associated” flag is a great reminder that there is an open change against a design from NX - Designer



WHAT'S NEXT?

1. Make it easier for Engineers to certify that they have incorporated hanging change.
2. Auto-closure of the ECR when all ECNs are incorporated.
3. Active Workspace Change



Thank You

Your feedback is important.

Please fill out the Session Survey in the Mobile App.

- Locate the session in the app
- Select "Take Survey"