

# Composing Teams with TEAMSTaR: A Tool for Evaluating and Mitigating Space Team Risk



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# The Problem

Team composition becomes a critical issue for mitigating the risks of Earth-independent missions

NASA has successfully designed crews with “the Right Stuff” for more than fifty years

- “Right Stuff” emphasizes the requisite individual characteristics (Wolfe, 1979)

“Right Combination” of team members is also required in deep space missions

# The Solution

## TEAMSTaR: Tool for Evaluating And Mitigating Space Team Risks

- a team composition decision support system

# Methods: Step 1

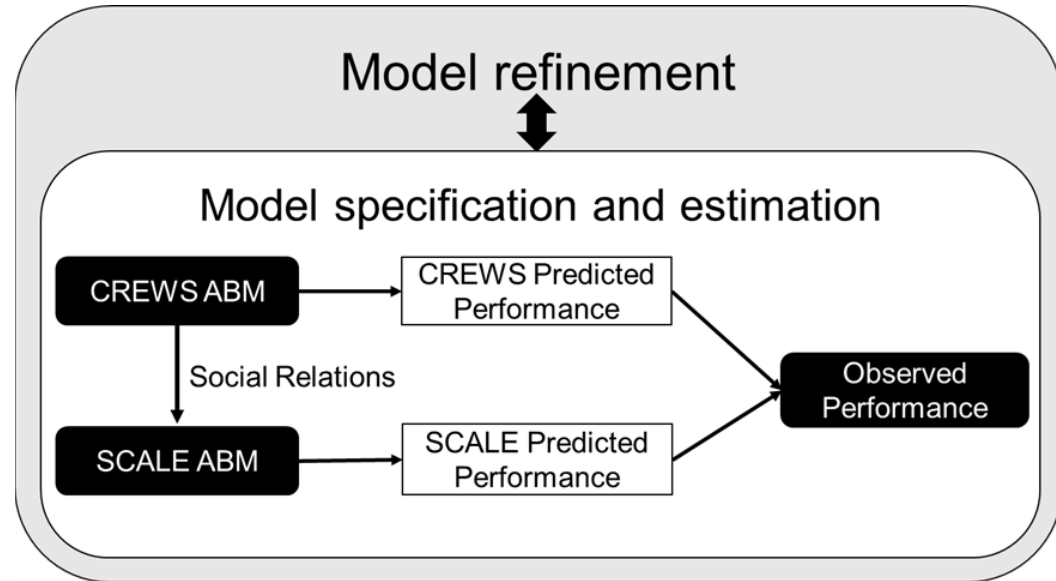
Leverage data and insights from Agent Based Models (ABMs) built for NASA-funded studies

## CREWS ABM

- Crew Recommender for Effective Work in Space  
(Antone et al., 2020)

## SCALE ABM

- Shared Cognitive Architectures for Long Distance Exploration  
(Lungeanu et al., 2022)



# Methods: Step 2

## Develop and validate TEAMSTaR

TEAMSTaR

NASA

Create Mission

Astronaut Pool

Reupload Astronaut Pool

ASTRONAUT POOL

(0) Results

Search: Type to narrow results

Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE

Astronaut Name  
NASA ID: 740 02  
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Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE

UPLOAD DOCUMENTS

Upload Characteristics

file-characteristics.csv Remove

Upload Relationships

file-relationships.csv Remove

Mission Name

Crew

Cancel Save

ROLE ASSIGNMENT

Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE  
CMD

Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE  
FE

Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE  
MS1

Astronaut Name  
NASA ID: 740 02  
VIEW PROFILE  
MS2

CREW SOCIAL RELATIONS

Alan Bean:MS2

Buzz Aldrin:FE

Neil Armstrong:CMD

Pete Conrad:MS1

Works Well Like Dislike Can Influence

# Methods: Step 3

Validate TEAMSTaR as a decision-making tool in short and long-term isolated, confined and controlled environments

- test the integration of the ABM
- test the user interface
- validate several use cases: pre and during mission

# Implications for Spaceflight

TEAMSTaR leverages computational techniques to:

- predict crew performance
- identify points of leverage in terms of team composition and task scheduling to optimize individual and team performance

Thank you!