Selecting Astronauts
The Role of Psychologists

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NASA – Johnson Space Center
Behavioral Health & Performance

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A Snapshot of Astronaut Demographics

Who becomes a US astronaut?

US astronauts selected
Number, by year

1959: 7
1962: 9
1963: 14
1965: 6
1966: 19
1967: 11
1969: 7
1978: 35
1980: 19
1984: 17
1985: 13
1987: 15
1990: 23
1992: 19
1995: 19
1996: 35
1998: 25
2000: 17
2004: 11
2009: 14

Military or civilian?

Civilian: 134
Military: 199

Hours of space flight time
Cumulative hours and year astronaut selected

Michael Finke: 9,159 hrs, 1996
Peggy Whitson: 9,048 hrs, 1996

Which ones have flown the most
By total number of flights and year selected

Franklin Chang-Diaz, 1980: 7
Jerry Ross, 1980: 7
Michael Foale, 1987: 6
Story Musgrave, 1967: 6
John Young, 1962: 6

Sex of astronauts

Male: 286
Female: 48

Sex

William McArthur Jr, 1990: 5,398 hrs
Mary Ellen Chiao, 1990: 5,544 hrs
Daniel Bartosh, 1990: 5,503 hrs
Michael Lopez-Alegria, 1996: 6,168 hrs
Cari Wolcz, 1992: 5,544 hrs
Jeffrey Williams, 1987: 8,976 hrs
Michael Foale, 1987: 8,688 hrs

Source: NASA
Your application materials have been submitted for consideration to the Johnson Space Center for Astronaut Candidate.

Make sure that you have read the announcement carefully and submitted all required documentation and application materials. Please note that submitting your resume and documents from USAJOBS may not be the only step in the process.

You may monitor the status of your application for Astronaut Candidate on the Application Status page on USAJOBS.
### Milestones in Selection 2013

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<th>N</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tr>
<td></td>
<td>Nov-Dec</td>
<td>Jan</td>
<td>Feb-Mar</td>
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<td>Applications received</td>
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ASB = Astronaut Selection Board  
JSC = Johnson Space Center
# Milestones in Selection 2013

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What is the goal of BHP?

• To weed out those not qualified to be astronauts due to medical psychopathology (Select-Out)
• To identify those best suited to being astronauts (Suitability)
What Makes Selecting Astronauts Challenging?

- Predicting behavior so far in the future
- Job likely to change before those selected fly
- Differentiating amongst a homogeneous pool
- Constrained by culture, ethics, law
Simplified Overview of the BHP Role In Astronaut Selection

Round 1

Psychological Testing

Test Brief

Team Exercises

Suitability Interview

Round 2

Clinical Staffing

Competency Based Summary

Select-Out

Select-Out Interview

Clinically Qualified/Disqualified

Astronaut Medical Board

Astronaut Selection Board
The Select-Out Process

• What does it mean to be considered qualified (Q) or disqualified (DQ)?
• Why is this a binding decision?
• What criteria are used to determine medical psychopathology?
• Once DQ always DQ?
Generalizability of NASA BHP’s Select-Out Process

- Greatest generalizability to public safety occupations
- Safety and ethics can be an issue at work for most any job
- More common methods for psychological select-out
  - Alcohol/drug screening
  - Situational judgment tests
  - Integrity/honesty tests
  - Counterproductive work behavior personality tests
Suitability

What it is … What it isn’t

Chris Hadfield of Bowie’s Space Oddity fame on YouTube
Simplified Overview of the BHP Role in Astronaut Selection

Round 1

SUITABILITY

- Psychological Testing
- Test Brief
- Team Exercises
- Suitability Interview

SELECT-OUT

- Select-Out Interview
- Clinically Qualified/Disqualified

Round 2

- Competency Based Summary
- Astronaut Selection Board
- Astronaut Medical Board
- Clinical Staffing
Suitability: Sample Competencies

1. Mental/Emotional stability
2. Performance under stressful conditions
3. Group living skills
4. Teamwork skills
5. Family issues
Team Exercises

• Goals of team exercises
  – To assess an applicant’s ability to perform in a team
  – To assess performance in terms of a subset of our competencies

• Development of team exercises
  – A lower fidelity simulation
  – Require applicants to work together to solve a series of tasks requiring physical and mental agility
Team Exercises
Evaluation and Generalizability

• Does it work?
  – Favorable feedback from astronauts, applicants, and assessors
  – Elicited a range of behaviors
  – Used BARS to assess on a tablet-based app

• Could it be applied to other jobs requiring problem-solving in the field?
  – Public safety occupations
  – Chemical and refinery plant and rig occupations
The Future of Psychological Assessment at NASA

- Remain a clinical process
- Revisions in response to updated competencies
- Little change to basic flow expected
- Continue to explore methods of gathering data
  - Situational judgment test
  - Biodata
Thank You