European Astronaut Selection 2009
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Milestones in Manned Space Flight

- 1961 April 12 – Yuri Gagarin first person in space
- 1961 May 5 – Alan Shepard first American in space
- 1964 – Formation of European Space Research Organization (ESRO) and European Launch Development Organization (ELDO)
- 1975 – European Space Agency (ESA) created by merger of ESRO and ELDO
- 1978 March 2 – Vladimir Remek (CZE) first European in space
- 1978 – ESA selects its first group of astronauts
First ESA Astronaut Selection

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  - Ulf Merbold (D) STS-9 1983 November 28
  - Wubbo Ockels (NL) STS-61A 1985 October 30
  - Claude Nicollier (CH) STS-46 1992 July 31

- 1980 – First CNES astronaut selection
  - Jean-Loup Chrétien (F) Soyuz T-6 1982 June 24
  - Patrick Baudry (F) STS-51G 1985 June 17

- 1982 – First DLR astronaut selection
  - Reinhard Furrer (D) STS-61A 1985 October 30
  - Ernst Messerschmid (D) STS61-A 1985 October 30

- 1989 – First ASI astronaut selection
  - Franco Malerba (I) STS-46 1992 July 31
  - Umberto Guidoni (I) STS-75 1996 February 22
Second ESA Astronaut Selection

- 1990 - European Astronaut Center (EAC) built in Cologne

- 1992 – Second ESA astronaut selection
  - J. F. Clervoy (F) STS-66 1994 November 3
  - Thomas Reiter (D) Soyuz TM-22 1995 September 3
  - Maurizio Cheli (I) STS-75 1996 February 22
  - Pedro Duque (E) STS-95 1998 October 29
  - Christer Fuglesang (SE) STS-116 2006 December 9
  - Marianne Merchez (B) Resigned before flight

- 1998 – National astronauts corps merged into single ESA astronaut corps
  - Hans Schlegel (D) STS-55 1993 April 26
  - Léopold Eyharts (F) Soyuz TM-27 1998 January 29
  - Roberto Vittori (I) Soyuz TM-34 2002 April 25
  - Frank de Winne (B) Soyuz TMA-1 2002 October 30
  - André Kuipers (NL) Soyuz TMA-4 2004 April 19
  - Paolo Nespoli (I) STS-120 2007 October 23
Third ESA Astronaut Selection

• 2008 Third ESA astronaut selection
  - Applications accepted from all ESA member states
  - First ESA selection without national pre-selection

• Application process
  - 0. Online application and medical pre-screening
    JAR-FCL 3 Class 2 May 2008
  - 2. Psychological tests October 2008
  - 3. Medical tests January 2009
  - 4. Professional interview March 2009
  - 5. Interview with the Director-General April 2009
  - 6. Final decision announced May 2009

• 8413 applications were successfully submitted
  - France 22%, Germany 21%, Italy 11%, Britain 10%
  - Female applicants 17%
Online Application

- Basic criteria
  - Background in science, engineering, medicine, or as a test pilot
  - Three years of work experience
  - Fluent in English
  - Age range 27-37
  - Physical fitness appropriate for age

- Medical JAR-FCL 3 Class 2 (PPL) certificate

- Online application questions:
  - Piloting experience
  - Language experience (Russian, French, German)
  - International experience / living abroad
  - Presentation /outreach experience
  - Participation in life science experiments
  - Medical / emergency experience
  - Hands-on experimental research experience
  - Participation in scientific expeditions
  - International research experience
  - Scientific publication
  - Professional associations
  - Sport activities (mountaineering, diving, caving, sky-diving etc.)
  - Manual skills
  - Charitable / community services
Cognitive Tests

• Individual computer-based cognitive tests lasting eight hours

• 918 candidates invited to participate in cognitive tests

• Several different types of cognitive tests, eg. perception test
  – Instruction: “Critical instruments: round and black”
  – Two seconds to memorize digits
Cognitive Tests

- Concentration test

- Instruction
  - Indicate whether the object has the same colour, orientation, or number of dots as the previous object.
Cognitive Tests

- Visual memory
- Auditory memory
- Spatial awareness
- Spatial orientation
- Multi-tasking

RC 83
KH 60

X 17
Cognitive Tests

• Mathematics
  – “A person goes from point A to point B. On foot it takes 3 minutes, on the conveyor belt 2 minutes. How long does it take if the person walks on the conveyor belt?”

• Mechanics/Engineering

Which construction is more useful to lift 100 kg?

1. 100 kg
2. 100 kg

1. 1
2. 2
none is useful
no difference
Psychological Tests

- Full day of psychological tests with six candidates participating per test day
- 192 candidates invited to participate in psychological tests
- Psychological tests encompassing:
  - Team problem solving
  - One-on-one cooperation tasks
  - Computer-based psychological questionnaire
  - Panel interview
  - Individual psychological interview
Medical Tests

• Week long series of medical tests
• 45 candidates invited to participate in medical tests
• Focus on medical fitness rather than physical fitness

• Medical tests encompassing:
  – MRI scans of brain
  – Ultra-sound scans of organs
  – X-ray scans of spine and hips
  – Heart-stress test
  – Visual and auditory acuity
  – Blood, urine, stool, and hair tests
  – 24 hour EKG and blood pressure tests
  – Colonoscopy
  – Psychiatric evaluation
Final Interviews

• Professional interview
  – 22 candidates invited to professional interview
  – Conducted by panel of senior ESA managers

• Interview with the Director-General of ESA
  – 10 candidates invited to interview

• Six new ESA astronauts selected
  – Samantha Cristoforetti (I) Fighter pilot
  – Alexander Gerst (D) Geophysicist
  – Andreas Mogensen (DK) Aerospace engineer
  – Luca Parmitano (I) Test pilot
  – Timothy Peake (GB) Test pilot
  – Thomas Pesquet (F) Air-France pilot / Engineer
Astronaut Training

- **Basic training (18 months)**
  - Class-room based learning
    - Russian language
    - Spaceflight, space systems, orbital mechanics
  - Private pilot license
  - Fast jet training
  - Scuba diving
  - EVA training (neutral buoyancy)
  - Survival training (eg. caving)

- **Advanced training (12 months)**
  - Hands-on training in mock-ups and simulators
  - Detailed study of all aspects of ISS

- **Mission-specific training (18 months)**
  - Training related specifically to an assigned mission
  - Full crew and back-up crew participation