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## CAREER DEVELOPMENT : ARTICLES

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### A Rare Opportunity Into Space

Elisabeth Pain  
Germany  
30 May 2008

Exceptional, highly motivated, flexible, emotionally stable, gregarious, with strong communication, interpersonal, and team skills. This is the [wish list](#) of characteristics for candidates to fill four new astronaut positions currently open at the European Space Agency (ESA). The odds of becoming an astronaut aren't especially good--tens of thousands of applicants are anticipated--but if you've always dreamed of working in space, now is not the time for reticence. This is only the third astronaut competition in ESA's history and the first since 1992.

As a result, partly, of ESA's involvement in the [International Space Station](#) (ISS), a joint initiative with the United States, Russia, Japan, and Canada to which Europe has contributed the Columbus laboratory, ESA feels it needs a younger and larger astronaut corps to meet the agency's ambitions.

"The probability [of success] is pretty low," admits Guillaume Weerts, head of the Management Support and Implementation Office at ESA European Astronaut Centre in

Luck will play a big role in whether you become an astronaut, so "don't put all your eggs in one basket," suggests ESA astronaut Reinhold Ewald.

Cologne, Germany. "But it's better to say, 'Okay, I have made an attempt, tough luck,' rather than saying, 'I could have attempted that but I didn't have the guts,'" Weerts says. "This is a very rare job opportunity."

### THE SELECTION PROCESS

The [selection process](#) is open to scientists under 55 from any of ESA's 17 member countries: namely, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United

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Kingdom. To be eligible, scientists need a M.Sc. degree or the equivalent and 3 years of professional experience; a Ph.D. is sufficient to meet this requirement. They need to speak English fluently. An additional European language, Russian, and flying skills are pluses.



Guillaume Weerts

To take part, candidates must [register](#) before 16 June 2008 by providing a private pilot medical [certificate](#). Depending on the country, this may cost up to €200, but "everything else will be burdened by the agency," Weerts says. Candidates can then submit an online application to be screened for the suitability of their qualifications, skills, and experiences. Of the thousands of applicants ESA expects, 1000 or so will be invited to "the real testing," Weerts says.

This "real testing" will encompass two stages evaluating various professional and psychological aptitudes. "We are looking for people who have both operational and scientific capacities" or who can demonstrate

the ability to gain those skills, Weerts says. Cognitive skills, such as the ability to do several things at the same time, will also be evaluated. Then, "at the personality level, we need to have people who will be able to spend 6 months in a space station in a very crowded space with five other people," Weerts says. This means being a good team player and being able to accept differences in a multicultural environment, he notes. The agency will also check whether you are "able to follow procedures, to obey a certain routine but at the same time be able to make decisions."

There is no preparation for such tests, Weerts says. Candidates "should simply be themselves. ... People who are faking, we will discover it at some point."

"These tests put you so much under stress" that there is no point trying to guess what answer the examiners want, agrees ESA astronaut [Reinhold Ewald](#). When he took the tests back in 1986--at that time, countries such as Germany and France managed their own astronaut corps, which were integrated into ESA in 1998--the psychological tests took the form of questions and riddles to answer in a very short time, whereas the operational tests required him to recall a large number of instructions, alone in a room, while being exposed to many distractions. In another test, he had to keep separate elements under control in a video game. "You get tired, and still you have to concentrate," Ewald says.

Those who pass these tests will then receive a thorough medical evaluation. ESA needs "people who are in good health and [in] a reasonable condition. We are not looking specifically for top athletes," Weerts says.

The last step is a formal job interview. Ewald's interviewers probed his interests, checked whether he was up to date with science news, and tested his ability to come to conclusions quickly. "If you make it through the interview, it's because they think you are an interesting discussion partner," Ewald says. With ESA astronauts acting as ambassadors for the agency, "we need also people who are able to communicate that passion and the beauty of the space flight," Weerts says.

The current selection process will last a year, but it will take no more than 2 weeks of candidates' time, Weerts says. Ewald remembers the process being tough, but he remembers it fondly. "The selection process was very exciting because when you finish a round, you don't know if you are going to the next round, and then you receive a letter that invites you," he says.

#### Ewald's way into the sky

Reinhold Ewald, 51, gained a Ph.D. in radio astronomy from the University of Cologne in Germany in 1986, together with a minor in human physiology. That

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year, the [German Aerospace Center](#) was looking for new astronauts, and Ewald, who read a lot of science fiction as a kid and wanted to work on "the interesting questions that you can research as an astronaut flying into space," applied.

But "it was a long way from being selected to actually flying," he says. A backup astronaut for the German-Russian MIR '92 mission, he ended up coordinating communications between the control center and the orbiting crew from the ground. Fortunately, he had another opportunity but not until 5 years later. After another 2 years of training in Star City in Russia, Ewald flew during the MIR '97 mission, spending 18 days on the Mir space station to perform biomedical and material science experiments.

With all his professional duties, Ewald "almost had no time to sit back and look [at] that incredible sight out of the window," he says. But each time you get "a few minutes, you try to spot your favorite places" on Earth, he adds.



Reinhold Ewald

## TWO FEET ON THE GROUND

Space "is a place where not many people have gone" and a place "of incredible beauty," Weerts says. But however mind-blowing and eye-opening the experience, there are some downsides, as there are in any job.

First, "there is a certain level of risk," although it's not tremendously high, Weerts says. "Rockets ... are not exploding every day, but it can happen." Perhaps the biggest drawback is that opportunities to do what you're trained for are infrequent. Some European astronauts waited almost 15 years for their first flight, and going into space four times is the record in Europe. "You need to save your enthusiasm" and put all your forces into preparing for when you will actually be flying into space, Ewald says.

Astronauts learn the basics of human space flight during their first 2 years. Then, after they are assigned a mission, they spend 18 months learning how to carry it out. Their mission may be operational, such as driving a vehicle or performing a repair. Sometimes astronauts are charged with carrying out some research experiments in disciplines as diverse as fundamental physics, biology, and physiology.

## FITNESS

"Living in space is not extremely physically demanding per se. You have less constraints being in space than on Earth," Weerts says. The main reason "fitness enters into the game is that after you have adapted to microgravity, when you come back, you have to get used again to full gravity." Once up there, you may also have to carry out some extravehicular activities in a pressurized spacesuit. This requires "real strength training," Ewald says.

Training itself can be taxing. "You have to travel all the time," Weerts says. "It can be extremely difficult, not only for you but [for] your family, too."

When they're not preparing for or going on specific missions, astronauts assume several roles on the ground. They may have to liaise with crews in space, review the feasibility of onboard

procedures, contribute to the development of future missions, or talk to the press. Between missions, they often take on other, typically high-level, ground-based duties. Ewald was in charge of leading Columbus's flight to ISS from the Columbus Control Centre in Germany earlier this year. Today, he heads the control center operating Columbus. After leaving ESA, former astronauts go on to hold many interesting [jobs](#), including Airbus test pilot, engineering professor at the Delft University of Technology in the Netherlands, and minister of science for France.

## VICARIOUS FLIGHTS

In a competition like this, a good dose of realism is healthy. Luck will play a big role in whether you become an astronaut, so "don't put all your eggs in one basket," Ewald suggests. "If you desperately want to become an astronaut, then you might give not such a good picture [of yourself] than if you are relaxed and try your luck."

Weerts, too, encourages people who really want to work in an area related to space to look at different opportunities. Space work is "a very bright and wide field," he says. For example, ESA is currently [looking](#) for technicians and scientists to help develop launchers and human space flight missions. Applying for the position of astronaut may help you win one of these jobs. Many of the candidates who don't make it still "will have high professional qualities that will not be completely forgotten," Weerts says. Outside of ESA, the different national space agencies may be recruiting, too, and "there is in Europe a very strong space industry."

"There are also other professions in the world of space that are very interesting, and you don't need to be an astronaut," Ewald says. "Most people working in the space area will never go into space, but they go [vicariously] by sending spacecrafts," Weerts adds.

### Further resources

- The [European Space Agency](#)
- Space [national agencies](#) in ESA member states
- The [Association of Space Explorers](#)
- The [International Space University](#)

Elisabeth Pain is contributing editor for South and West Europe.

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