



## Symposium: The Problem of Space Travel

**Washington, March 27** - The Embassy of Slovenia hosted a symposium dedicated to Herman Potočnik Noordung, a Slovenian pioneer of space travel and modern cosmonautics and astronautics.

The symposium was composed of two panels: The first, on Herman Potočnik Noordung's work and ideas, and the second, on the future of space travel.

Herman Potočnik Noordung's work and ideas were presented by:

- **Mr. Frederick Ordway**, a space scientist and a well-known author of visionary books on spaceflight; he was also a technical consultant to the film *2001: A Space Odyssey*;
- **Mr. Michael Neufeld**, a historian, Chair of the Division of Space History, National Air and Space Museum; the author of the world winning biography of Wernher von Braun; and
- **Mr. Dragan Živadinov**, an artist and a cosmonaut candidate from Slovenia.

The future of space travel was discussed by:

- **Ms. Sunita L. Williams**,

Deputy Chief, Astronaut Office, Johnson Space Center, NASA.

She was assigned to the International Space Station as a member of Expedition 14 and then joined Expedition 15;

- **Dr. John Logsdon**, Director of the Space Policy Institute, George Washington University;
- **Mr. Frederic Nordlund**, Head of the Washington Office, European Space Agency;
- **Dr. Dušan Petrač**, Retired Space Scientist at the Jet Propulsion Laboratory.



*Ms. Sunita L. Williams*



A special guest of the event was **Ms. Sunita L. Williams**, the second astronaut of Slovenian origin after Ronald M. Sega to have been selected by NASA for a space mission. Ms. Williams holds the record of the longest spaceflight (195 days) for female space travelers.

Ms. Sunita L. Williams was born on September 19, 1965 in Euclid, Ohio, to a Slovenian mother and an Indian father. Although born near Cleveland, Ohio, she considers Needham, Massachusetts to be her hometown. She attended Needham High School in Needham, Massachusetts, graduating in 1983.



Ms. Williams donated to Ambassador Samuel Žbogar a Slovenian flag, which accompanied her into space.

She went on to receive a Bachelor of Science degree in Physical science from the U.S. Naval Academy in 1987, and a Master of Science degree in Engineering Management from Florida Institute of Technology in 1995. She is married to Michael J. Williams. Her parents, Dr. Deepak and Mrs. Bonnie Pandya, reside in Falmouth, Massachusetts. Her official bio states that her recreational interests include running, swimming, biking, triathlons, windsurfing, snowboarding and bow hunting.



The initiator of the event was **Mr. Dragan Živadinov**, a Slovenian theatre director and astronaut candidate who directed the first theatre performance in zero gravity.

Dragan Živadinov co-founded the Neue Slowenische Kunst in 1985. He also founded the Scipion Nasice Sisters Theatre in 1984 and directed some cult performances. In 1987 he founded the Red Pilot Cosmokinetic Theatre performing at Zenit Observatory in 1988. In 1990 he formed the Noordung Cosmokinetic Cabinet and made the Noordung Praying Machine in 1992.

In 1995 Živadinov dedicated himself to telecosmism, telelogy, and the 50-year projectile, Noordung, named after the Slovene space scientist Herman Potočnik Noordung. The first show, "One Versus One," opened on April 20, 1995, with restaging taking place every 10 years, the first one being on April 20, 2005. The show will play until April 20, 2045.

On December 15, 1999 Dragan Živadinov created Noordung Biomechanics, the first performance in zero gravity space researching revolutionary changes, which take place in the human body in a situation of a weightless theatre, produced by Project Atol Institute. It took place in the Russian cosmonaut training aircraft in the skies above Moscow dealing with the problem of the time/space paradigm and the subject as an actor and performer in the electronic era. In 2005, the Noordung's production Supremat was performed at Helix as a part of the NSK event in the city of Dublin celebrating European enlargement.



Mr. Dragan Živadinov

Mr. Arnd Wesemann Ballettanz from Berlin wrote the following about Mr. Živadinov: *"If choreography is writing with bodies in space, then his is the largest-scale choreography ever. Dragan Živadinov from Ljubljana is the first artist in the history of space travel to be trained as a cosmonaut. In conditions of simulated zero-gravity, so-called parabolic flights, he is working on dances to be performed in the cosmos. With "Praying Machine Noordung", his earth-bound production for the Ljubljana Ballet, he is also*

*proving himself to be a maximalist, temporally as well as spatially. Živadinov's plans to return to this piece every few years with exactly the same troupe, replacing each member as he or she inevitably dies over the decades with a recording of music, until one day only a concert remains on earth. The cremated bodies of the departed will continue the choreography by orbiting the earth as satellites in suprematist-style urns. He has chosen the infinite vastness of space as an arena because only weightlessness can ensure eternal movement. The dance of the space urns will go on for ever. This must be the most glorious monument ever created by dance in honor of itself."*



Another Slovenian participating at the symposium was **Dr. Dušan Petrač**, a Slovenian physicist who has become one of the leading scientists at NASA. Thanks to Dr. Petrač, NASA saved billions of dollars in its program of infrared satellites, because Dr. Petrač called NASA's attention to a temperature problem associated with the infrared detectors, which would otherwise get destroyed in space.



Dr. Dušan Petrač



The event was followed by a reception. The main dish was the "Space Sausages" from Cleveland. Namely, the sausages were of the same brand as the sausages taken with Sunita on her space mission.

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### **Herman Potočnik Noordung**

The Slovenian rocket engineer and pioneer of cosmonautics (astronautics) was born on the 22nd of December, 1892 in Pola, southern Istria, Austro-Hungary (now Pula, Croatia). In 1928 he was the first man in history to make plans for an orbital space station and geostationary satellites.

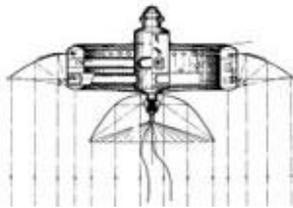
His father Jožef was born in 1841 in Razbor near Slovenj Gradec and he served as a doctor and high

navy officer in the Austro-Hungarian Navy. His mother Minka was born in 1854 and was a daughter of a well known wine merchant Jožef Kokošinek from Maribor.

Herman Potočnik made a complete and detailed plan for an orbital space station with artificial gravity (rotating habitable outer ring), which would be powered with solar energy. Since solar power cells were not yet known at that time, Noordung conceived a closed system of pipes producing steam for the steam turbines. His designs also described breathing apparatuses, space suits, elevators and airlocks, such as we now find in actual space stations. He even mentioned the future of nuclear energy and photon drives.

His contributions to science are very important directly and indirectly by his influence over many contemporaries, later researchers and scientists, not to mention science fiction writers. He was an engineer and an excellent mathematician; therefore all his plans for the space station were actual blueprints ready for construction.

Noordung also made the first plan for a geostationary satellite and even calculated its orbit. Today we cannot imagine a modern life without satellites. He was a visionary describing the development of a geostationary satellite civilization in space at a time when horse droppings were a common site in European cities.



Potočnik died in August of 1929 in Vienna only a couple of months after the release of his book *The Problem of Space Travel - The Rocket Motor*. The book was published in Berlin in 1928 but it was not translated into Slovene until 1986. The work is interesting because Potočnik knew of his impending death while writing it and was therefore waging a battle with time. Consequently we can sense a shift from a more mathematical approach full of formulas and dry calculations in the first part of the book towards a more philosophical viewpoint dealing with civilization in space in the second half of the book.

NASA got the translation of this work only in 1995, while the book was translated into Russian as early as 1935 on the order of Konstantin Tsiolkovsky, who was at that time already proclaimed a Russian hero. Tsiolkovsky is known as the father of space programs. The book was reprinted in Russia in 1950, making it one of only three scientific books ever to be reprinted there.

The design of Noordung's space station was copied numerous times in science fiction movies (2001: A Space Odyssey, Mission to Mars, Solaris). Today Noordung's orbit is mistakenly named Clarke's orbit. Arthur C. Clarke (the author of 2001: A Space Odyssey) was studying Potočnik's ideas and later developed the first satellite. He also regularly quoted Potočnik in his articles.

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**Informance:: 8008 - Space Art/Art in Space**

**March 29 - You are invited to attend an art performance Mr. Dragan Živadinov in Numark Gallery, downtown DC.**

**Visual support by Dunja Zupančič and Miha Tursič (Slovenia).**

**Live music act by Takatsuna Mukai (London, UK).**

**Location: Numark Gallery, 625 E Street NW**

**Time: Saturday, March 29 at 8.00 pm  
no admission**