



# US & THEM

WITHOUT  
FRONTIERS



TECHNICAL  
MUSEUM  
OF SLOVENIA

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THE ADDRESS OF THE DIRECTOR OF THE TECHNICAL MUSEUM OF SLOVENIA .....	4
THE ADDRESS OF THE GENERAL CONSUL OF THE REPUBLIC OF SLOVENIA .....	6
BEHIND US AND THEM .....	10
PRIMOŽ TRUBAR, IN THE BEGINNING WAS THE WORD .....	12
HERMAN POTOČNIK NOORDUNG, THE FIRST SPACE ARCHITECT .....	18
ANTON PETERLIN, DESTINY IS YOUR EFFORT! .....	24
PETER FLORJANČIČ, LIVING A DREAM .....	30
ALEŠ STROJNIK, BEYOND THE VISIBLE .....	36
FRANCE RODE, SILICON VALLEY PIONEER .....	42
ANTON MAVRETIČ, SPACE VOYAGER .....	48
MARIJA STROJNIK, PLANET HUNTER .....	54
SUNITA L. WILLIAMS, SPACE WALKER .....	60
SLOVENIAN IMMIGRANT COMMUNITY IN THE UNITED STATES FROM PAST TO PRESENT .....	68
TECHNICAL MUSEUM OF SLOVENIA .....	72



## THE ADDRESS OF THE DIRECTOR OF THE TECHNICAL MUSEUM OF SLOVENIA

I am excited that the Technical Museum of Slovenia's exhibition *Knowledge without Frontiers* will finally cross the border, even the ocean, and make the journey of the Slovenian women and men who emigrated time ago and, either themselves or their descendants, became established professionals in various fields, in particular science, engineering, innovation and research.

Unfortunately, our knowledge of these important individuals and their achievements, time and again accomplished through hardships, leaves much to be desired, as they deserve to be remembered and appreciated.

Let us recall few more individuals of Slovenian descent who are not presented in this catalogue, but they left a strong mark in North America. Friderik Irenej Baraga was a Catholic missionary and later a bishop who ministered to a vast diversity of peoples in the region of Lake Superior in the 19th century. Baraga made a difference in the native Indian community. For example, he published a grammar – the first ever of any Indian language – and a dictionary of the Otchipwe language (Otchipwe-English and English-Otchipwe) spoken by the Chippewa Indians.

Quite a few Slovenians tried their luck in the entertainment industry as actors, singers or musicians, while others became successful journalists, artists and athletes. Currently, Goran Dragič, Anže Kopitar and Luka Dončić are at the top of the best-known-Slovenian-athlete list.

Not to forget people who made it in politics. Frank Lausche (Lovše) was elected senator and governor of Ohio and mayor of Cleveland, being the first mayor of Slovenian origin of any American major city. George Voinovich's political career was similar to Lausche's. Best known today is Amy

Klobuchar, the first woman senator from Minnesota and an important figure in the political and public life of the United States. Her father was of Slovenian descent, and one of her ways to honor her ancestors' heritage is to make poticas for Christmas, sending them to her fellow politicians.

(Too) often, migrations are associated with "an emergency situation", "a problem", while completely ignoring that they are a historical and social structural phenomenon that makes a positive contribution to the communities we live in.

Old as humankind, migrations contribute significantly to economic and social development, and as such, they will be a key to reaching the objectives of sustainable development in the future.

Through dedication to science, our compatriots presented in the exhibition went beyond frontiers; not only the state borders of their homeland, but they also defied those most persistent – frontiers in our heads and minds.

What can museums do to break them? A modern museum involves the public, it doesn't exclude anybody, meaning it is accessible, inclusive and participatory. Its objective is to preserve, protect, hold, pass down, interpret and exhibit heritage identified valuable enough to be preserved. The Technical Museum of Slovenia is a keeper of movable technical heritage, while at the same time it is our mission, a major one, to make the achievements in science and engineering, together with the people credited for them, known and appreciated. In the end, museum is people, and only people can cross the frontiers they have set themselves.

Science and engineering contribute to progress, and museums are a place for a critical assessment of progress and development.

Our fellow compatriots – to whom this awarded exhibition is dedicated and who we proudly present in the catalogue – found their new homeland in the U.S. But first, they had to find a way to make this land their own. How did they

accomplish that? By doing their best to add to its prosperity and welfare of its people, and by affecting a lot more than a particular geographic area and their own time. They live on through their knowledge, findings, inventions, research, innovations and, quite often, their role in education, proving it is possible to (co)shape the future and make it better.

I am confident they never abandoned the memory of their ethnic origins and the homeland of their fathers and grandfathers. This year, Slovenia celebrates the 30th anniversary of independence. The exhibition we present perfectly coincides with the anniversary which symbolically lifts *Us and Them without Frontiers* to a higher level.

Identity and heritage enrich us, they demonstrate who we are. Once we know it, we can add our little piece to the mosaic of the world which belongs to all of us. Following the example set by the featured individuals, the world can be made a better place, more connected and gentler to the lives of us all, without exceptions.

A big thank you to Ms. Alenka Jerak, General Consul of the Republic of Slovenia in Cleveland, without whom our exhibition would never make it to the United States, my colleagues at the museum and in particular Dr. Estera Cerar and Irena Marušič, curators at the Technical Museum of Slovenia and project managers of the exhibition, which was in the Republic of Slovenia properly acknowledged by being granted the 2018 Valvasor Award, the highest award for achievements in the field of museology.

Sincere thanks to the Ministry of Culture of the Republic of Slovenia for their financial support to the project.

Safe journey to the exhibition on its U.S. tour. I am sure it will do a lot of good and open many new worlds.

**Dr. Barbara Juršič**

Director of the Technical Museum of Slovenia

## THE ADDRESS OF THE GENERAL CONSUL OF THE REPUBLIC OF SLOVENIA

Here it is. Finally. The exhibition *Us and Them without Frontiers*, what else.

A tour of the Technical Museum of Slovenia's exhibition to the United States has been planned for quite a while. Unfortunately, the new "normality" of the COVID-19 pandemic crushed all our plans to the point that we almost gave up hope on showing it to the American public and the Slovenian immigrant community.

So it happens that the presentation of the scientific, engineering, technological and other achievements of successful Slovenians, both men and women, in the United States coincides with the 30th anniversary of Slovenia's independence. It is an extra reward for all the effort invested in the preparation of the exhibition installations in Cleveland, Milwaukee, Chicago and Washington, as well as over eighteen months of uncertainty, waiting to be finally able to meet in person, like human beings normally do, not over some high-tech web application. Which is perfectly fine, it just doesn't feel the same.

In the pandemic, the scientists from different disciplines and all four corners of the world proved once again that science and knowledge indeed have no frontiers – neither in relation to time nor country. And it is still true that the past can be a great teacher for the future.

Knowledge, with a right dose of courage, can be the inspiration to fulfill the dreams and build a better world. We need to dream, have the courage to take a step forward and make our dreams come true.

This step was taken by many Slovenian women and men who emigrated in search for work, a better life, new experience or because of political situation in the country. Today, about 350,000 people of Slovenian descent live in the United States of America, and as much as seventy-five percent in six states (Ohio, Pennsylvania, Illinois, Minnesota, Wisconsin and California). Together with other Americans and immigrants, they actively participate in the political and economic development of the U.S., representing a small piece in a most diverse cultural landscape.

The same as in other large cities, the Slovenian community in Cleveland – which lost the title of the “third largest Slovenian city” long ago – maintains the national and cultural identity through the activities organized by national homes (*narodni dom*), various societies, parishes with the Slovenian language schools held on Saturdays, fraternal organizations, recreation centers, museums, newspapers and radio shows. Despite being the third or fourth generation of immigrants, Slovenian Americans, one way or another, preserve their ethnic identity.

This exhibition in particular draws attention to Slovenians who are - except Primož Trubar - somehow related to the USA. Through their work and knowledge, scientific achievements and innovations, they contributed to the progress and welfare of the American society. These individuals include the expert in electron microscopy

Aleš Strojnik, the first space architect Herman Potočnik Noordung, the space voyager Anton Mavretič, the planet hunter Marija Strojnik, the space walker Sunita L. Williams, the Silicon Valley pioneer France Rode and the world-class innovator Peter Florjančič who passed away last November.

However, there are a lot more Slovenians who left their mark in different walks of life on this side of the Atlantic. To mention just few of them: Joseph Frederick Sutter – aeronautical engineer, the “father of the 747”; Frank J. Lausche and George Vojnovich – Senators, Ohio Governors and Mayors of Cleveland; Frankie Yankovic – “America’s Polka King”; Ronald J. Zlatoper – U.S. Navy Admiral; Dr. Ronald M. Sega – Major General in the U.S. Air Force and NASA astronaut; Prof. Dr. Duncan Haldane – 2016 Nobel Laureate in Physics; Ivan Zorman – poet and composer, and as many as ten Catholic bishops – from Frederic Baraga to the current bishop of the Diocese of Cleveland, Edward C. Malesic.

I could not agree more with the words of the exhibition curators – never has knowledge acknowledged any frontiers, be it visible or invisible. It is usually the scientists who dare to go beyond the familiar, known and safe, capable of crossing any frontier. Because their only frontier is (lacking) knowledge.

Congratulations to the Technical Museum of Slovenia and the exhibition curators Irena Marušič and Dr. Estera Cerar. *Knowledge without Frontiers* won them the 2018 Valvasor Award, the highest Slovenian award in museology. It further validates the significance of the exhibition and its aim: learn from the past for the future. Learn about migrations, a phenomenon as old as humanity, which made our world a better place.

**Alenka Jerak**

General Consul of the Republic of Slovenia

# US AND THEM WITHOUT FRONTIERS

Contributors: **Ester Cerar, Milojka Čepon,  
Orest Jarh, Edvard Kobal, Irena Marušič,  
Martina Orehovec, Marija Strojnik, Blaž Šef**



## BEHIND US AND THEM

The concept of Slovenia has existed since around the 6th century, but its ethnic lands – be it through the domination of powerful monarchies or as the result of a movement for self-determination – always formed a part of something bigger, the two best-known examples being the Austro-Hungarian Empire and Yugoslavia, respectively. Because of this heritage, the geostrategic location as a gateway from the southeast to western and northern Europe, and a variety of other reasons, including historical, religious, ethnic, socioeconomic, political, climate, etc., its territory has seen a lot of people come, leave or – especially over the recent years due to instability in the Middle East – just pass through.

The exhibition *Us and Them without Frontiers* is all about movement of people in both directions – in and out of the countries. If anything, migrations are not a new phenomenon, they have been a part of human history since ancient times. Which is good. Just imagine the world had people never left their homelands. No exploration of foreign lands and civilizations, no dissemination of knowledge, no exchange of ideas, no collaboration, no scientific and technological milestones and breakthroughs. No nothing. A truly miserable place.

So why do we insist on using the terms such as “us” and “them” or “ours” and “theirs”? What does it mean, and feel, to be Slovenian or American, a migrant or an immigrant or any other word (some nice, some not so nice) that we use to describe the migration of people? How come that intelligent and reasonable beings keep failing to realize that nothing lasts forever? In fact, what is claimed “ours” today could easily become “theirs” tomorrow.

Migrations have an undeniable and permanent influence on society. They did prove to be a good thing in the past, just think of the “no nothing” world. What changed? Why are many hesitant to the notions of “foreign”, “different” and “unknown”, which are often associated with

migrants? The fact is that our society is changing, public opinion is divided, politicians and the media are, for obvious reasons, sensationalist and the outcome is that people are confused. As a museum, we inspire the visitors to look beyond the known and to move across frontiers; not just the visible ones, but even more importantly, those invisible, to embrace the ideas and people who carry them across the borders.

The original project of the Technical Museum of Slovenia *Knowledge without Frontiers* focused on the positive impact of migration on society, aiming to point to a strong connection between technical and scientific heritage on the one side, and cultural and national identity on the other. The exhibition was dedicated to successful individuals across different fields of science and engineering who migrated to or from Slovenian lands from the 16th century to the present.

Scientists and inventors have always crossed frontiers for a variety of reasons, either out of their own free will or because they were forced to leave. Sometimes they did it to improve their living conditions and job opportunities or simply to expand their knowledge. However, history also bears witness to the fact that a person can become a “stranger” in their own land. States and their borders change, and Slovenia is a perfect illustration as this happened several times in the previous century alone. From the Austro-Hungarian Empire to Yugoslavia, gaining independence 30 years ago and becoming a part of the European Union. There are many scientists and inventors who were born in one country, lived in another and died in a completely different one.

Now, probably this is not unique to Slovenians, but we are so proud of “our” scientists when they make it abroad, and yet a lot more restrained when “foreigners” are successful in our country. Two examples that illustrate the challenge perfectly: the record-holding astronaut, Sunita Williams was born in the USA to an ethnic Indian

father and a mother descended from Slovenian immigrants. However, Slovenians think of her as one of “ours”. Williams is often featured in the national media and we seem to be extremely proud of her. She won over even the most reluctant by taking a traditional Slovenian sausage up to the International Space Station! At the other extreme is Fritz Pregl. Not featured in this exhibition because he has no connection to the U.S., he provokes mixed emotions. He was born in Ljubljana (the capital of Slovenia) to a Slovenian father and a German mother. Pregl studied and worked in the Austro-Hungarian Empire and in later years in Austria (after the collapse of the empire), his working language was German, hence he was considered “not Slovenian” enough. For decades he was left out of our science history records and books despite being one of the two Nobel Prize winners of Slovenian origin to date!

The tour of the *Us and Them without Frontiers* exhibition to the United States coincides with the 30th anniversary of Slovenia’s independence, and we thought it was a perfect opportunity to show “our” contribution to the advancement of scientific and technological development within “your” great nation. We want people to understand how misleading and narrow-minded such assumptions can be by portraying the lives of the featured individuals, who not only made a difference with their achievements, but did so because of migration.

The exhibition explores the fascinating connections between our two nations and the benefits of sharing the knowledge beyond frontiers, the idea which is best summed up in the line of the Slovenian rap song *From People to People* by Murat & Jose: “It does not matter where you come from, what counts is what’s in your mind”. We might just add – and in your heart.

**Irena Marušič, Estera Cerar**

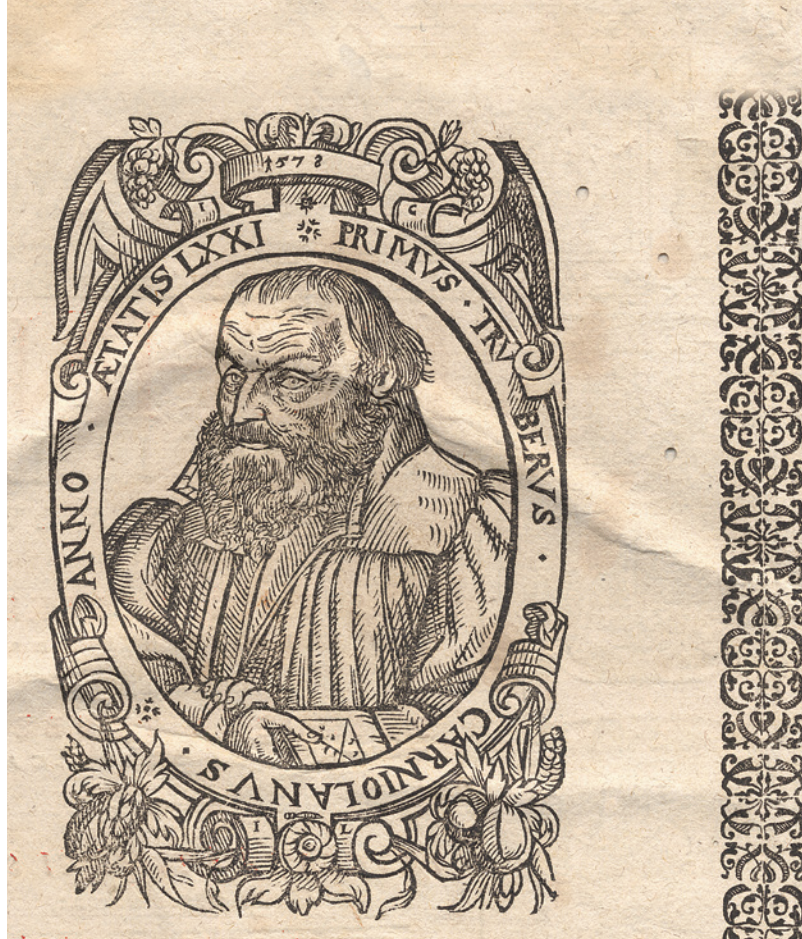
Exhibition Curators, Technical Museum of Slovenia



# PRIMOŽ TRUBAR 1508-1586

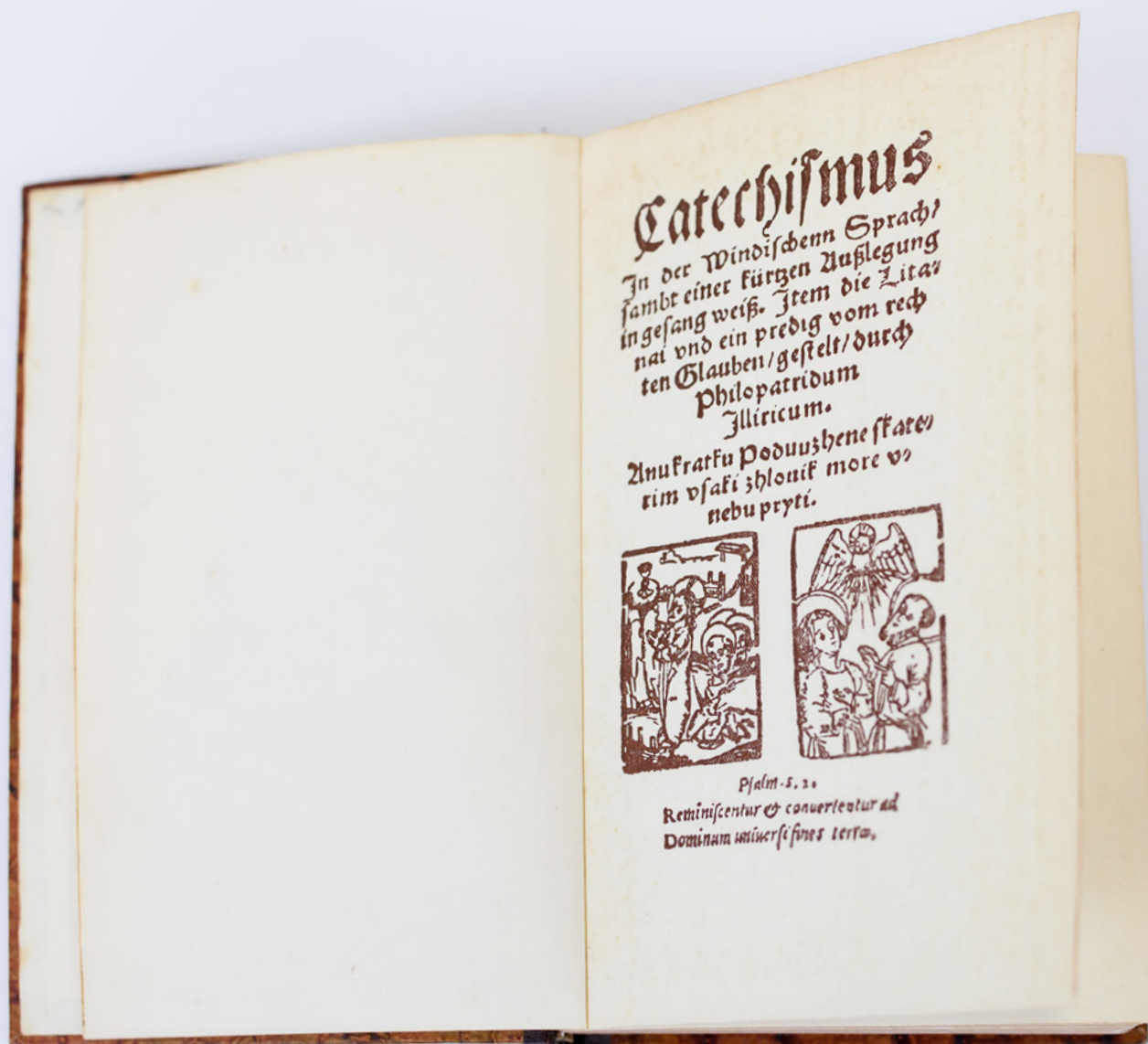
## IN THE BEGINNING WAS THE WORD

Protestant priest, religious reformist, translator, the author of the first printed book in Slovenian, the founder of the Slovenian literary language.



A portrait of Primož Trubar. Woodcut, Jacob Lederlein, 1578.

Born on 8 June 1508 in the village of Rašica near Velike Lašče, Primož Trubar studied theology in Rijeka, Salzburg, and Vienna. He was a catholic priest but after converting to Protestantism, he was forced to flee to Germany. Following his return to Ljubljana, he took up the position of vicar of the Protestant Church in Ljubljana. Exiled in Germany once again, he settled down in Derendingen, where he died on 28 June 1586.



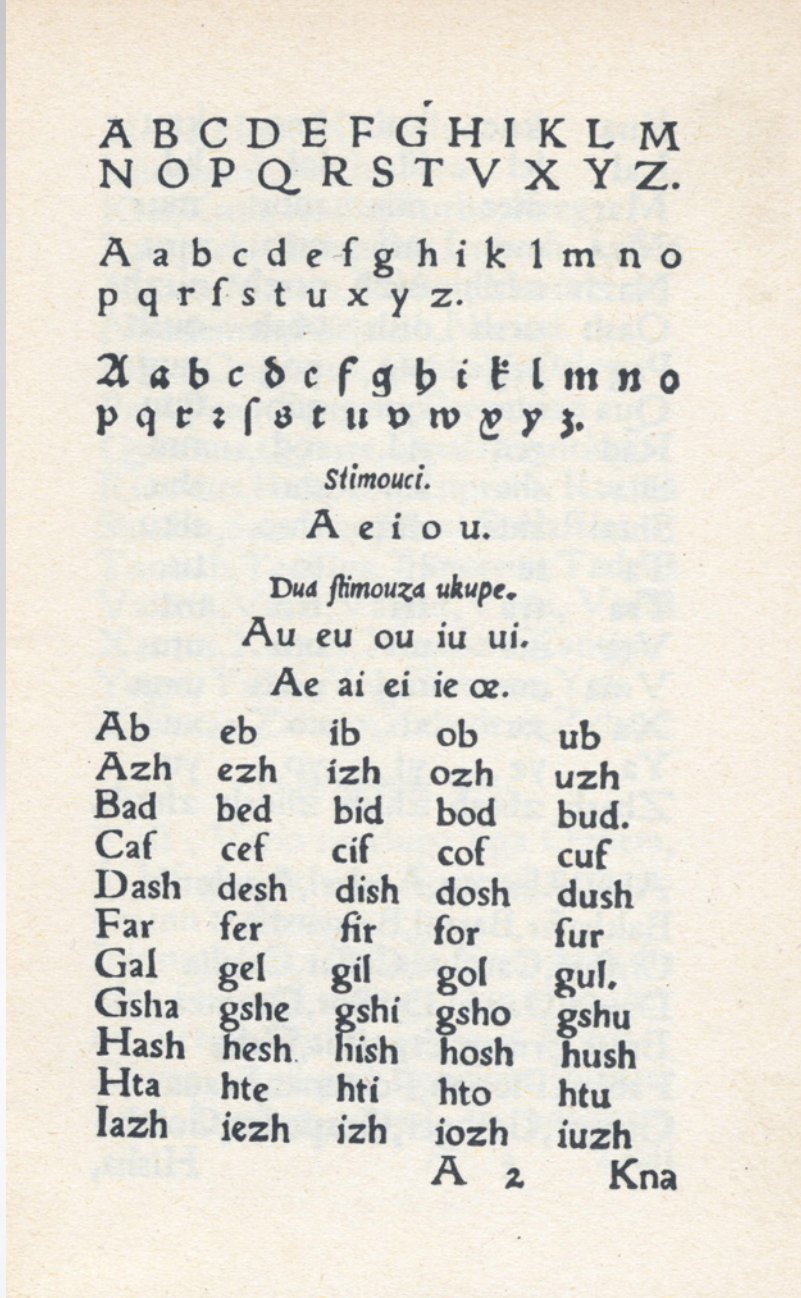
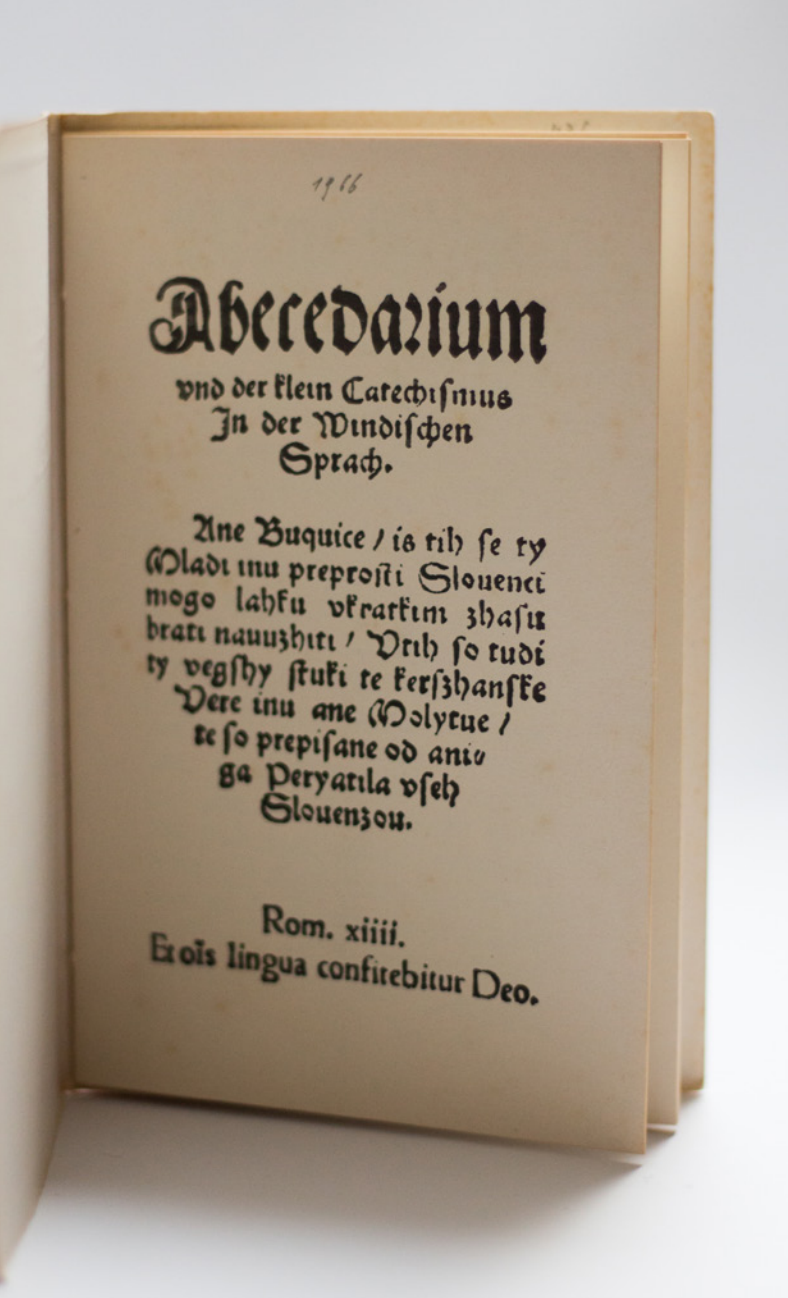
A reprint of Trubar's *Catechism* from 1935. Technical Museum of Slovenia. Photo: Nebojša Tejić, STA.

## BELOVED SLOVENIANS...

In 1550, Trubar wrote and published the first printed book in the Slovenian language, the *Catechism*. It could be said that without his work all the great Slovenian scientists in this exhibition may not have the same cultural identity they brought to the USA, and Peterlin would never have argued the finer points of Slovenian grammar at his home in Washington.

Trubar was guided by the fundamental value of Protestantism: to make the word of God accessible to the common people in the vernacular. With *Catechism*, he built the foundations of a literary language designed to be understood by the speakers of all Slovenian dialects. In his time, Slovenian only existed in the form of geographically and socially dispersed dialects. By creating a single language, he unified the Slovenian nation and highlighted its uniqueness to the outside world. To this day, his actions remain a pillar of the Slovenian national identity and statehood.



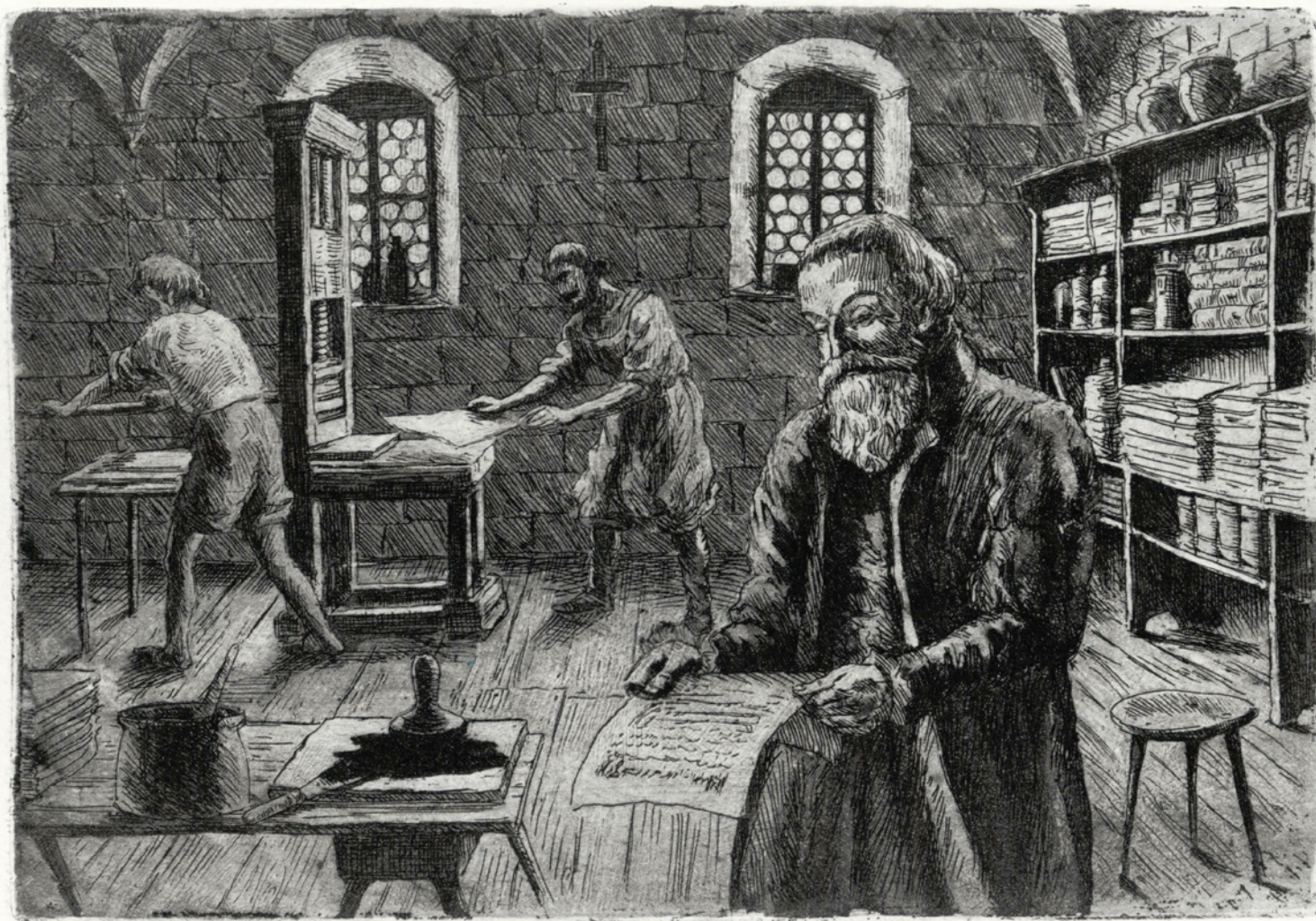


*Abecedarium*, 1550 (reprint). Photo: Sanja Živković.

## ABECEDARIUM - THE FIRST ALPHABET

Realizing that the people first needed to learn to read and write, he followed up the *Catechism* the same year with the *Abecedarium*, an eight-leaf booklet containing the first Slovenian alphabet.





Trubar in a printshop. Etching. Saša Šantel, 1942.

## TRUBAR'S POTICA

The first record of potica, Slovenia's signature cake, dates to Trubar's era. At the time, it was called *povitica*, meaning a cake made of rolled dough. The expression appears in the 1575 edition of the *Catechism* and the *New Testament* of 1577.

## BOOK BARRELS

Printed in Germany, all Trubar's books were shipped to Slovenian readers in wooden barrels. Being waterproof, barrels were used to transport all manner of goods. This was also the best way to conceal the content of shipments and smuggle forbidden Protestant books at a time when Protestants were being persecuted.





The statue of Primož Trubar, the work of sculptor Franc Berneker, was erected in 1910 in Ljubljana. Photo: Irena Marušič.

## Literature

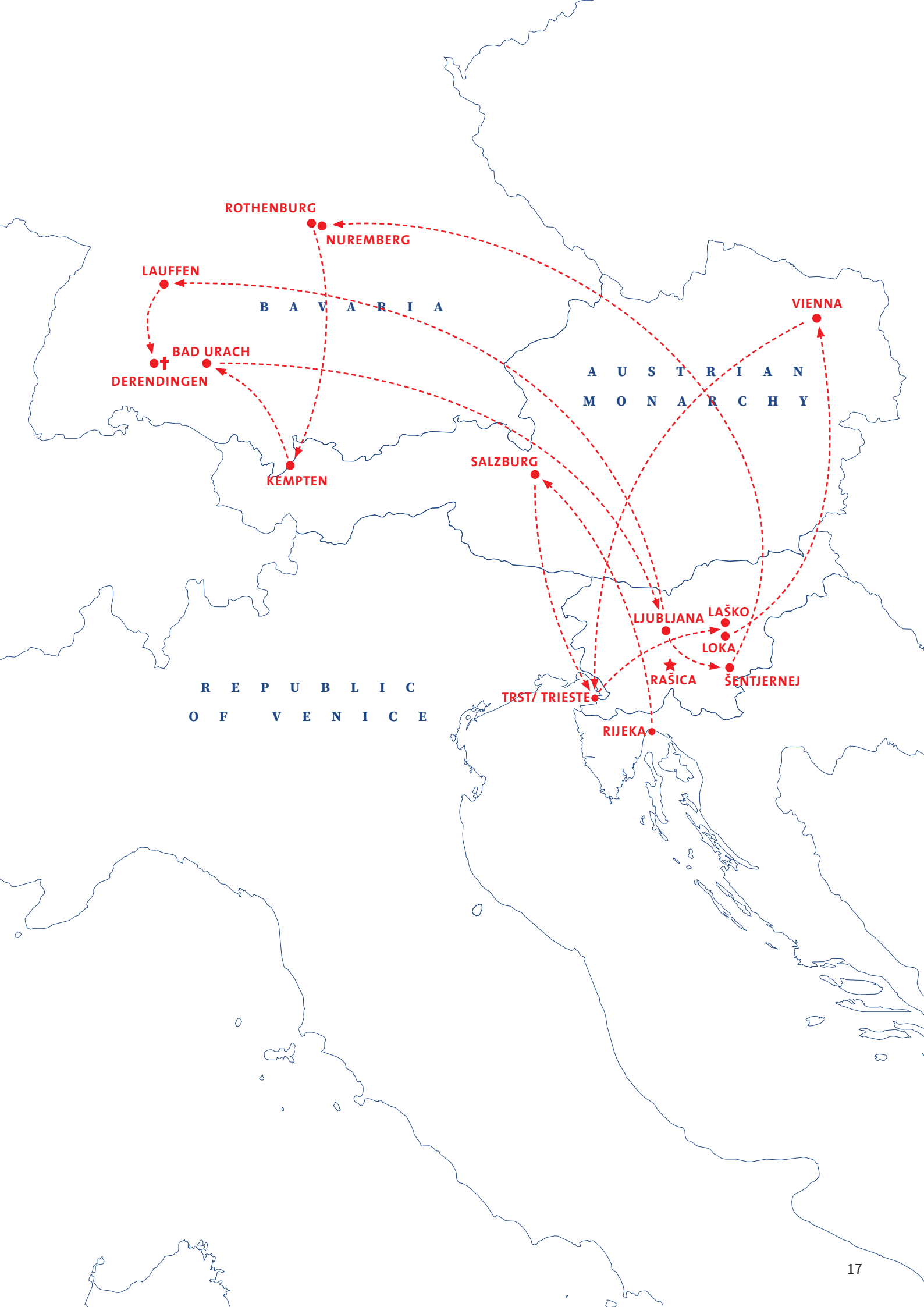
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Janez Bogataj, Potica iz Slovenije, Ljubljana, 2013.

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# HERMAN POTOČNIK NOORDUNG

1892-1929

## THE FIRST SPACE ARCHITECT

Engineer, rocket technology specialist, military officer, and astronautics and space flight pioneer.



One of the few photos of Potočnik.

Herman Potočnik Noordung was born on 22 December 1892 in Pula (Croatia), where his father, a native Slovenian, was working as a navy physician. Following his father's sudden death, the family moved to his mother's birthplace, Maribor (Slovenia), where he completed elementary school. He attended the technical military academy in Mödling near Vienna. A year after finishing his studies in 1913 as an expert in bridge and rail construction, he ended up on the battlefields of the First World War, where he contracted tuberculosis and received a medical discharge at the age of 27. Despite poor health and financial problems, he managed to graduate from the College of Technology in Vienna. He died on 27 August 1929 in Vienna, where he is buried.

He never went to the United States, however, his visionary ideas were instrumental to the development of space technologies.



## SPACE TRAVEL

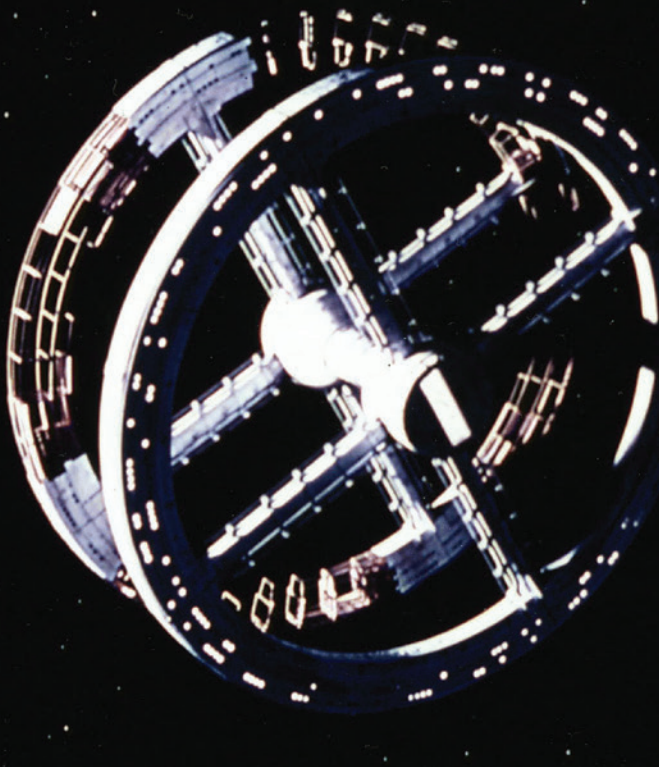
Writing under the pen name Noordung, he published his only book in 1928, *Das Problem der Befahrung des Weltraums* (The Problem of Space Flight - The Rocket Motor), and it is still considered one of the fundamental works of the first generation of space flight pioneers.

It directly influenced the work of the second generation of space pioneers and helped establish a new science – astronautics. This work, the first part of which deftly and concisely summarized the relevant work of his predecessors, introduced several revolutionary methods for dealing with flight in zero gravity and in a

Potočnik never lived to see any of his ideas come to fruition nor go to space. However, the Slovenian edition of his book (on the picture) was taken by Russian cosmonauts to the International Space Station, currently the only human settlement not on planet Earth. Cultural Centre of European Space Technologies (KSEVT). Photo: Nebojša Tejić, STA.

vacuum. His most valuable contribution was the design of a space station, which is regarded as the first comprehensive example of architecture in space. There is evidence that Werner von Braun and other key personalities within the new NASA space program were desperately keen to see the book translated to English. One of the beneficiaries of Noordung's book was celebrated science fiction author Arthur C. Clarke.





Potočnik's spacecraft in Kubrick's film *2001: A Space Odyssey*, 1968. Photo: NASA.



Interview with Frederick I. Ordway III at the Embassy of the Republic of Slovenia in Washington, 2008. Photo: KSEVT.

## 2001: A SPACE ODYSSEY

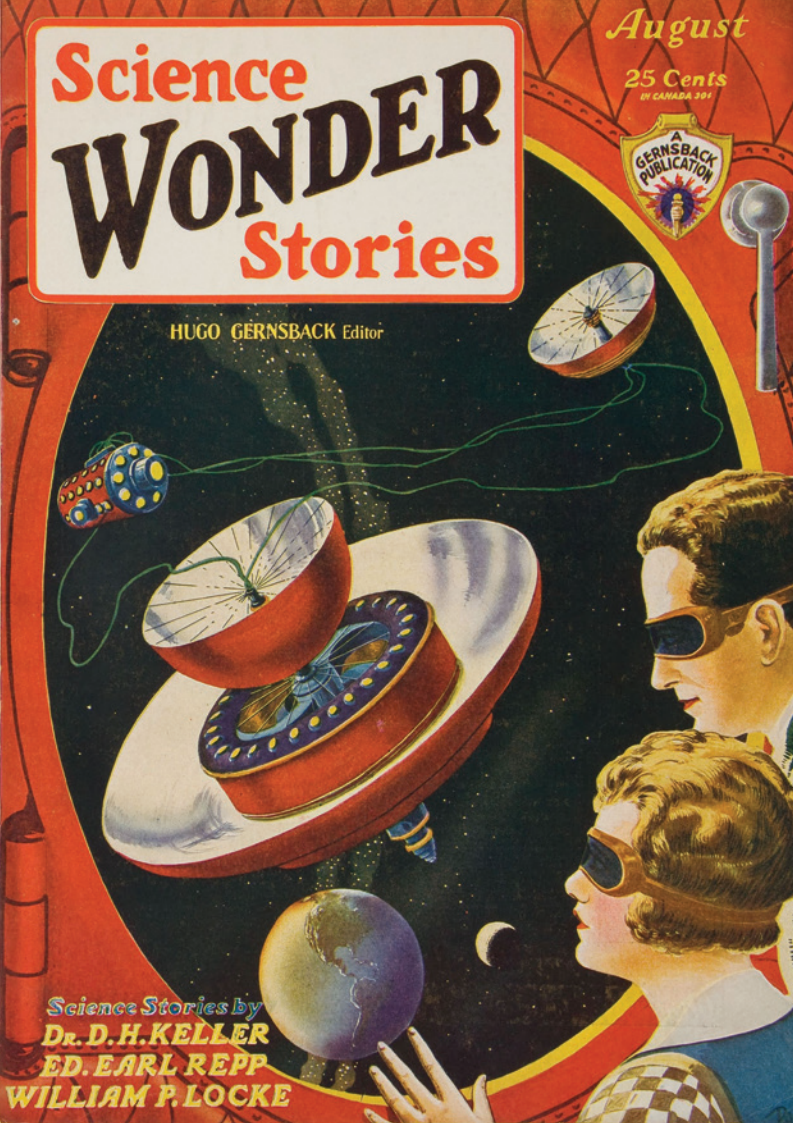
Herman Potočnik Noordung was the first person to recognize the importance of geostationary orbit. He proposed that his space station be placed in geostationary orbit, and several decades later Arthur C. Clarke popularized the idea in the *Wireless World* magazine. His space station was designed to spin around an axis, with the centrifugal force generating artificial gravity, thus enabling humans to spend longer stretches of time in space. Space architects from around the world have copied his spinning circular design and it even appeared just before the moon landing in Stanley Kubrick's *2001: A Space Odyssey*, inspired by a short story by Clarke. Even now, communications and broadcast satellites typically operate in geostationary orbit.

## FINALLY

"I have read the first full English translation of Noordung's *Das Problem der Befahrung des Weltraums* with a sense of both relief and satisfaction — relief that the book is finally accessible to the English reading public and satisfaction that the project was achieved in the first place. Like most efforts that are ultimately realized, from my perspective the Noordung translation had quite a history."

Frederick I. Ordway III

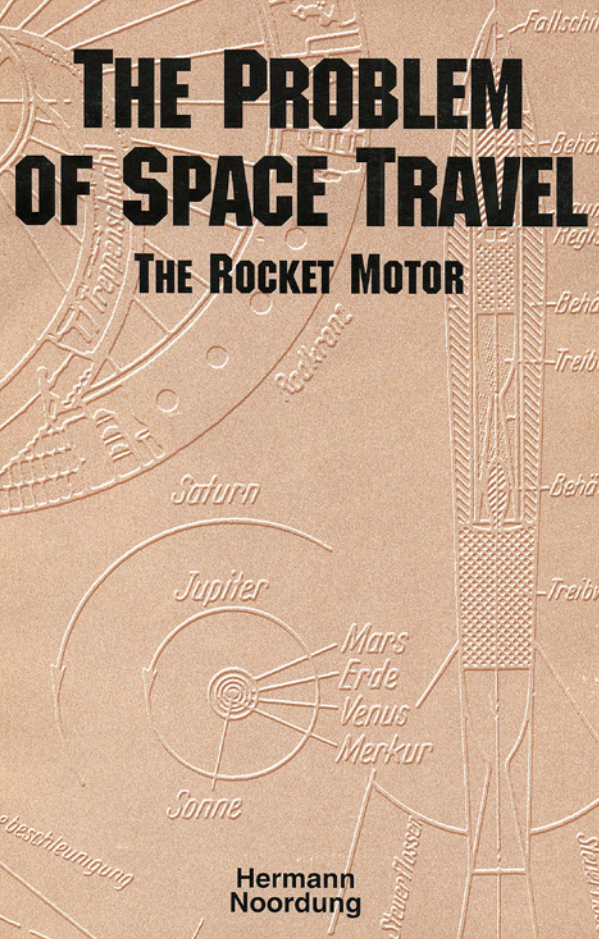




The August 1929 issue of the magazine *Science Wonder Stories*.

## U.S. CONNECTION

He may have never set foot on the American soil, but his ideas of space travel reached America. The first ever color illustrations of a space station in the U.S. were of Potočnik's station on the cover of the *Science Wonder Stories* magazine in August 1929 – the precise month of his untimely death. Frank R. Paul accurately illustrated all three segments of the station: the observatory, the support module with a solar array, and the circular living unit.



English edition of Noordung's *Das Problem der Befahrung des Weltraums* was published by NASA in 1995.

## SLOVENIAN VISIONARY

“Potočnik was a great visionary and a good engineer. His ideas about spacecraft were unique during his time. Slovenians should celebrate him more, for there are few visionaries such as Potočnik. Unfortunately, some writers designated him as Austrian, Czech, etc., but we don't have to be so humble when it comes to telling the world the truth and, when justified, brag and state with pride that Potočnik was a Slovenian visionary.”

Anton Mavretič





Center Noordung. Photo: KSEVT and Tomaž Gregorič.

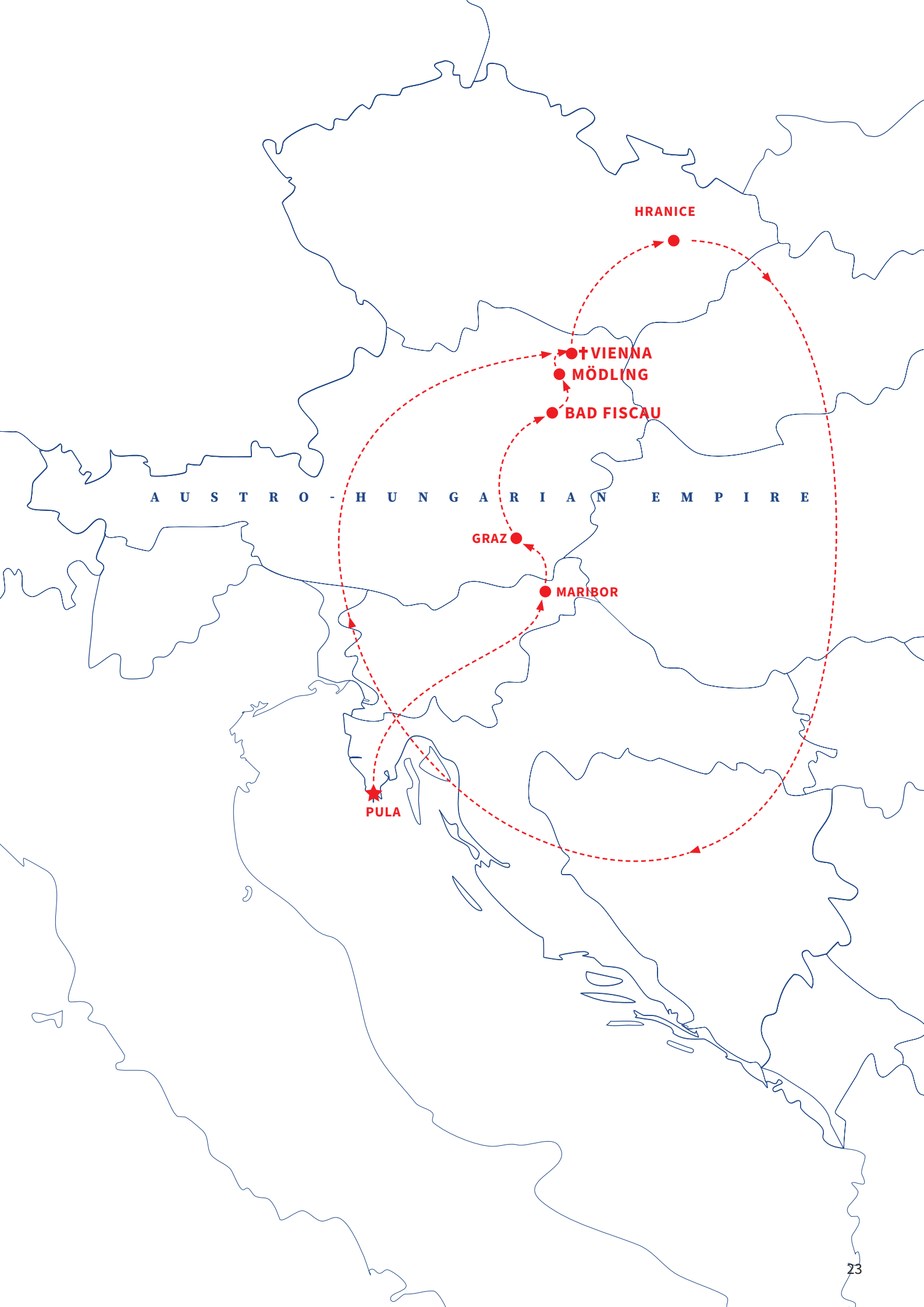
## SPACE ARCHITECTURE ON PLANET EARTH

The Herman Potočnik Noordung Center of Space Technologies (Cultural Centre of European Space Technologies until 2017) is located in a small town Vitanje in northeastern Slovenia where his mother's family hails from. Its architecture is based on the design of the circular living unit, a constituent of the geostationary space station as described in his book.

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HRANICE

†VIENNA

MÖDLING

BAD FISCAU

A U S T R O - H U N G A R I A N E M P I R E

GRAZ

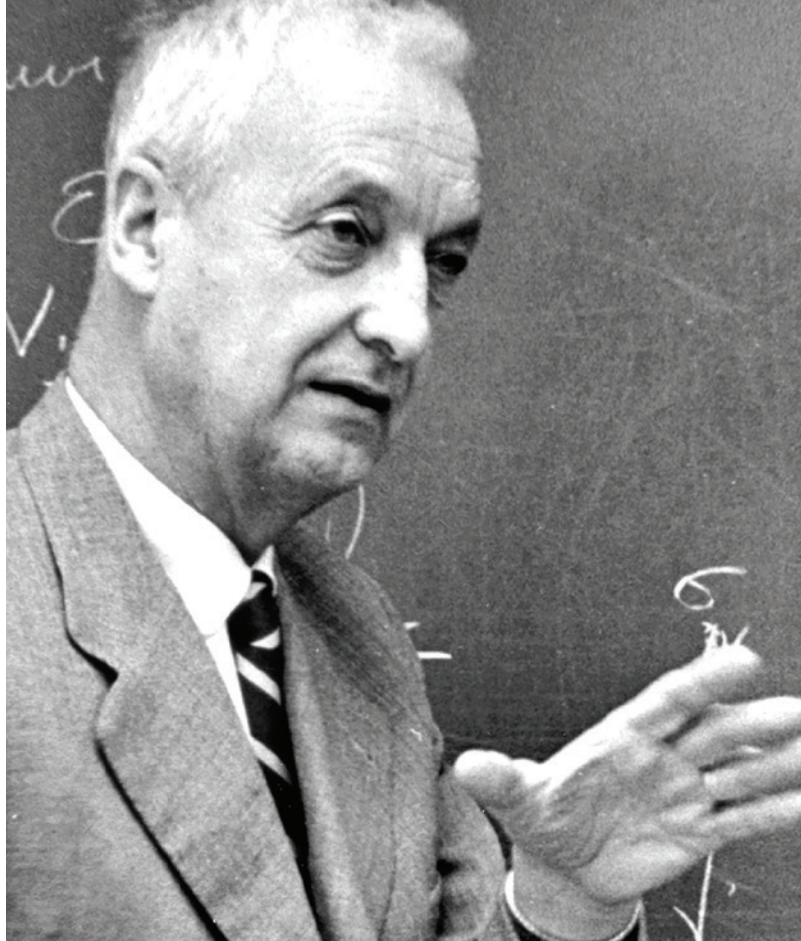
MARIBOR

PULA

# ANTON PETERLIN 1908-1993

## DESTINY IS YOUR EFFORT!

Scientist, professor of experimental physics, polymerphysics researcher, inventor, innovator, a world-renowned expert in large molecules.



Peterlin delivering a lecture in 1970. Photo: Družina Publishing.

Anton Peterlin was born on 25 September 1908 in Ljubljana. Upon completing secondary school, he enrolled at the Faculty of Arts, University of Ljubljana, and after graduating took a position at the Technical Faculty's Physics Institute. He spent a year in Berlin, where he earned his PhD in 1938, but returned to the Faculty of Arts to become an assistant professor in the physics department and a tenured professor in 1946. The Slovenian Academy of Sciences and Arts elected him a full member in 1949. A series of disagreements led him to leave his homeland and head to Munich in 1960, and then to the USA the following year, where he became the director of the Camille Dreyfus Laboratory in Durham, NC. Concurrently, he taught at Duke University and at Cleveland State University as a visiting professor. In 1973, he accepted a position at the National Bureau of Standards in Washington, where he worked until 1992. He died on 24 March 1993, only a few months after returning to Ljubljana.





Peterlin's attaché case, which he purchased during one of his first trips to the U.S. and used practically daily ever since. Technical Museum of Slovenia. Photo: Nebojša Tejić, STA.

## UNPROMISING POLYMERS

Peterlin focused his research efforts on the study of polymers, large molecules composed of smaller units called monomers. He once recounted how the study of polymers had been considered unpromising in the post-war years and smart people were advised to avoid this field. Subsequent developments would prove the naysayers very wrong, for polymers still play a fundamental and multifaceted role in our lives owing to their broad range of applications.



Used by engineers and engineering students to carry out quick and fairly accurate calculations, slide rules were a common tool in mechanical and electrical engineering, aircraft design, the military, in surveying, and in all other fields where logarithms, trigonometry, roots, squares, multiplication, and division were required. Slide rules were eventually replaced by the HP-35 calculator, which France Rode helped design in 1972. Technical Museum of Slovenia. Photo: Nebojša Tejić, STA.



Peterlin giving a lecture after being awarded honorary membership by the Jožef Stefan Institute, 1968. Photo: Jožef Stefan Institute.



Peterlin compiled a dictionary of his own to practice English. Technical Museum of Slovenia. Photo: Leja Kolenc.

## THREE UNIVERSITY OAFS

There is an amusing anecdote about Peterlin. The confusing situation after the World War Two is beautifully illustrated by the story of the “three university oafs”, as Peterlin himself called it. Three university professors, all of them called Anton (Peterlin, Kuhelj, and Moljk) were sent off to Italy with suitcases full of money to buy research equipment. It was not possible to buy such equipment officially in Yugoslavia and so that trip was barely legal. The expedition would turn into a nightmare, for the professors were intercepted by the carabinieri, who confiscated three million liras from them and locked them up for several months. It took diplomatic intervention to get them out of prison, but the efforts to get the money back lasted six years. In the end, only half a million liras out of three was returned.





Peterlin's family donated to the museum several objects, which, among other things, testify to his ardor for technological developments.  
Photo: Tomo Jeseničnik.

## GUARDIAN OF THE LANGUAGE

Peterlin was known as a strict guardian of the Slovenian language. His students were more concerned about speaking proper Slovenian than they were about scientifically accurate language. One could debate science with him but debating Slovenian language – that was ill advised.

## FOREIGNER

“Despite living and working in the U.S. for a long time, Peterlin’s answer to the question whether he liked his life in America was that he felt a foreigner. Although he could discuss scientific problems fluently, his everyday English, according to him, left much to be desired. He did not know how to buy bread, for instance – his wife had to do it.”

Ljubov Petrovna Mjasnikova





Peterlin had many passions aside from his work, including hiking and skiing. Private Archives.



When Anton Peterlin received an honorary doctorate from the University of Ljubljana in 1988, his bust, the work of sculptor Marjan Keršič-Belač was erected in front of the Jožef Stefan Institute. Photo: Sanja Živkovič.

## Literature

Anton Peterlin, exhibition curated by Stanislav Južnič, TMS, September 24, 2008.

Sitar, Sandi: 100 slovenskih znanstvenikov, Ljubljana, 1987.

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# PETER FLORJANČIČ 1919-2020

## LIVING A DREAM



Portrait of Peter Florjančič taken just few months before he passed away.  
Photo: Marko Cotič Trojer.

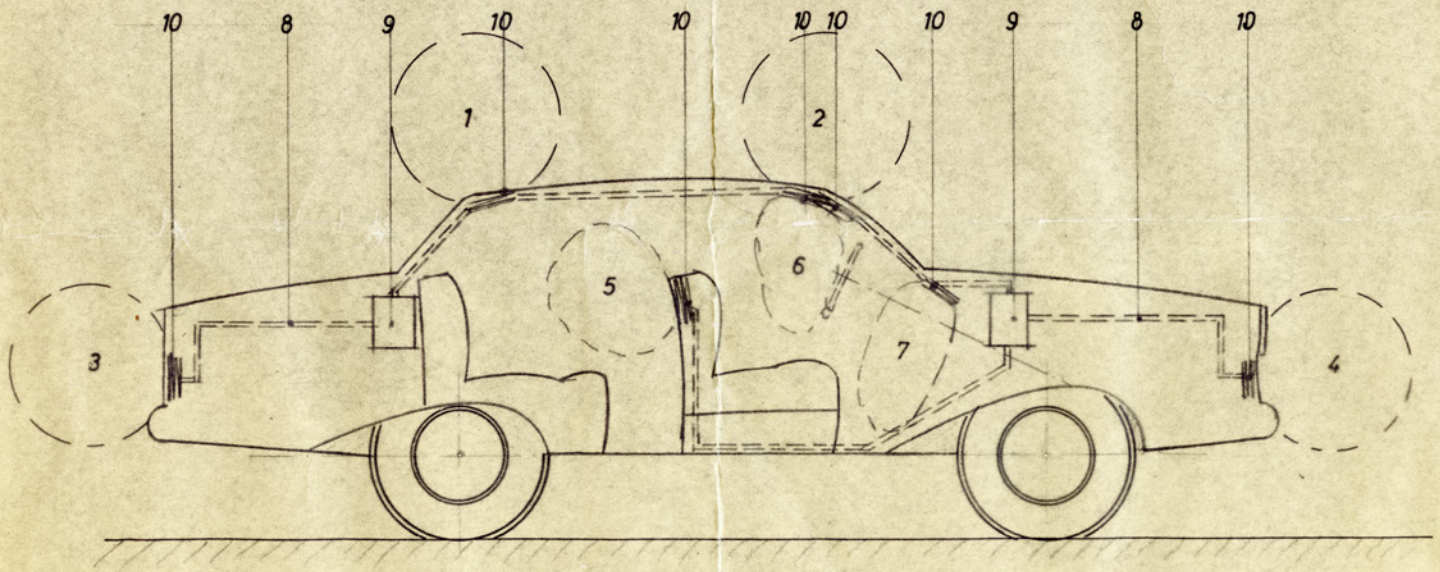
Athlete, musician and actor,  
adventurer, cosmopolitan,  
entrepreneur and, first and  
foremost, world-class innovator.

Peter Florjančič was born on 5 March 1919 in Bled. As a youth, he was a promising athlete and participated at the 1936 Winter Olympics in ski jumping. His entrepreneurial spirit became evident early on and he started a successful weaving business before WWII. To avoid conscription into the German army, he fled from Bled in 1943. He staged his own death in avalanche and then crossed the Alps on skis to get to Switzerland.

He had a long, inventive and eventful life, living and working in five European countries and even spent a short time in New York on business. Pasha Ilhami Hussein, whom he met in Monte Carlo, introduced him to the world of the rich and famous. They founded *Florilham*, a successful company manufacturing products mainly for the cosmetic industry.

In 1998, he returned home to Bled where he continued to work on inventions. He died on 14 November 2020.

**FIG.1**



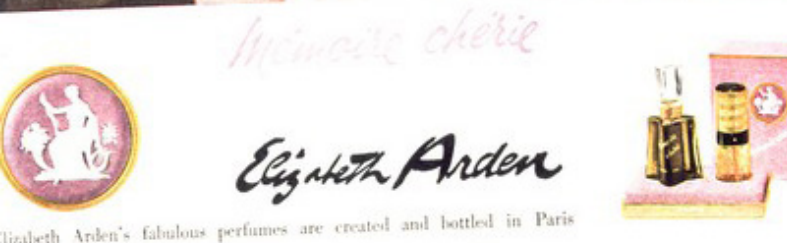
Some of his ideas were ahead of their time. When he thought of car air bags back in 1957, the car industry of the time lacked technology to allow the implementation of this revolutionary innovation.

## I WILL BE AN INVENTOR

He was convinced that to have the slightest chance of a successful invention, one needs to observe people and the world around, giving them what they need and are willing to pay for. He experienced both incredible success and bitter failure from which he learnt valuable lessons. His first invention was a hand loom that could be operated by the disabled people. He patented it during his stay at the internment center in Bern and sold the patent for serious money. At that point he decided to be an inventor by profession. Of about 400 patents, he realized 43.

If it had not been for Florjančič, women would not be able to spray perfumes nor apply nail polish elegantly. Photographers loved his plastic slide frames, and businessmen appreciated a plastic injection-molding machine. In his exciting career, he worked with some prominent foreign companies, such as Guerlain, Elizabeth Arden, Coco Chanel, Kodak, Fuji, AGFA, Babcock, Battenfeld, Bussman, Melitta, as well as local, including LEK and Paloma.





Elizabeth Arden, the legend of the cosmetic industry, found Florjančič's perfume atomizer interesting enough to invite him to New York where they struck a deal. A couple of days before his 101st birthday, we recorded an interview with Florjančič recounting – vividly and with humor – his U.S. adventure. Unfortunately, he died a few months later.

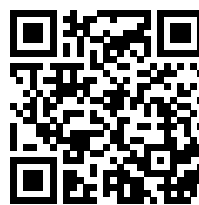
## PERFUME ATOMIZER

“My best and most accomplished invention was definitely the perfume atomizer. Perfume is one hell of a product, difficult to atomize finely enough to meet the requirements of the perfume industry. To be able to fully develop the atomizer, my patient financiers had to dig deep in their pockets. But they were billionaires, and it was all just entertainment to them.”

Peter Florjančič



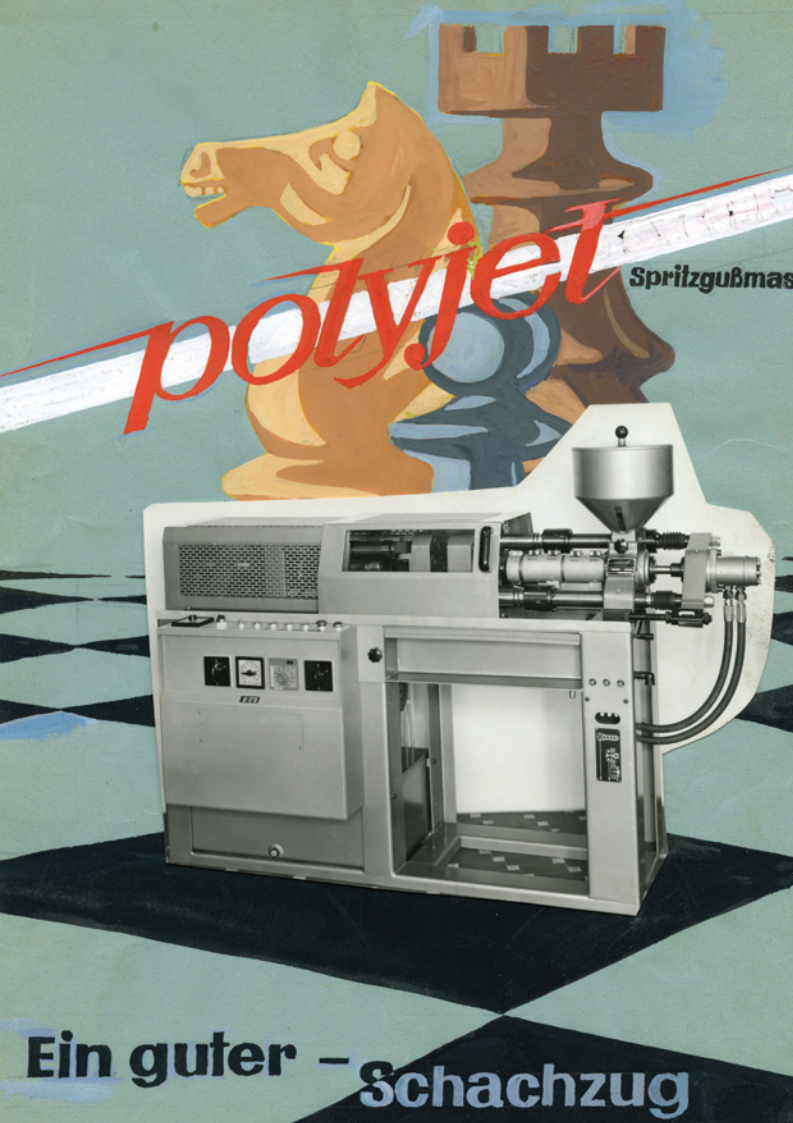
Launched in 1947, the bottle with atomizer was developed by Florilham. Their first products were made of precious materials – crystal, silver and gold. Private Archives.



If we were to choose one from a myriad of patents, it would inarguably be the perfume atomizer, which literally conquered the world and whose operating principle is still in use today.

Its invention was closely related to the development of plastic. Perfumes contain corrosive substances, and a special plastic was required to allow its extended use. The atomizer development took two years. Despite looking plain, the operating mechanism, which is composed of 18 different parts, is quite complicated.

However, the work of an inventor is not just about the finished product, it also has to do with tools and machinery for its mass production. To produce atomizers, Florjančič built a tabletop plastic injection-molding machine called the *Colibri*, which he over time further developed and adapted depending on the products and requirements of different companies.



Plastic injection-molding machines were mass-produced in Florjančič's factory in Villach. He moved to Austria 1962. Private Archives.



Florjančič lived in five countries, he was a citizen of five countries, and held two 'extra' passports, namely the Nansen passport, an internationally recognized refugee travel document from the WWII, and the World Passport issued by the World Service Authority founded by Garry Davis in 1954. Private Archives.

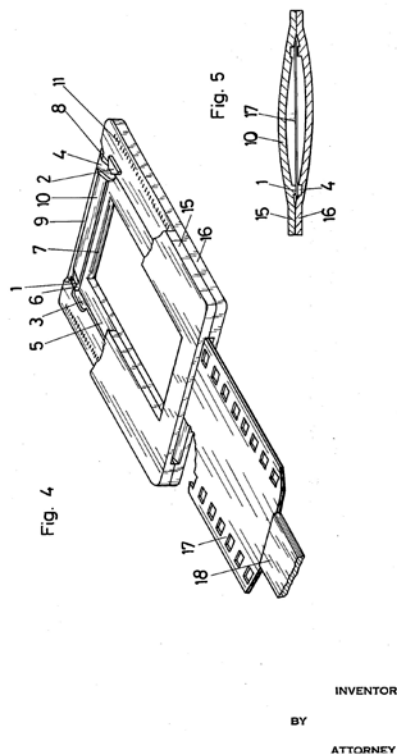
## FAREWELL TO PLASTICS

After the Second World War, plastic was nothing short of a magical material with a huge potential. Florjančič took full advantage of that and patented a whole lot of products for everyday use. Eventually it turned out that, without plastic, the world might be a better place. Florjančič fully agreed and, in line with sustainability, implemented the Reduce, Reuse, Recycle principle in his later work.

One of his last inventions which made it to actual production was *Francesko*, a foldable birdhouse from 2012. Made of recyclable cartonplast, it is completely weatherproof.

The birdhouse is simply attached to the window, which means that one can observe birds from the comfort of their own apartment. According to research, watching birds had a beneficial effect on people's health and behavior, especially in cases of depression, loneliness and dementia. An increase of well-being was also observed with people with special needs.

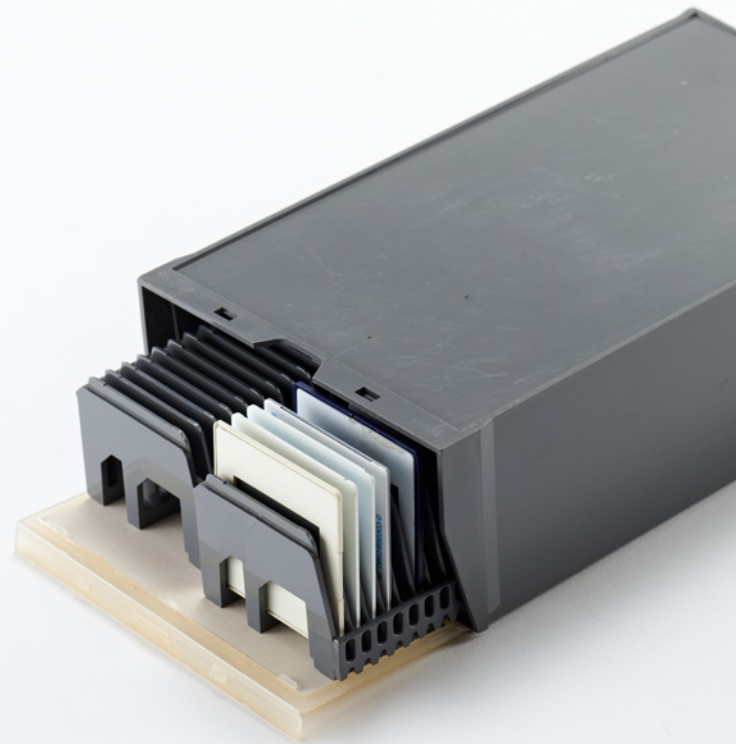




Application for the slide frame patent protection in the USA, 1976.  
<https://patents.justia.com/patent/3952434>

## FAMOUS FRAME

In 1966, Florjančič was commissioned to design a slide frame and slide feeder, with a condition that both items could be patented. Made of Bakelite and glass or cardboard, frames in use did not do a good job. He demonstrated once again that he knew perfectly how to capitalize on the development of plastic. For a long time, he searched plastic resistant to high temperatures of the slide projector and impermeable to light, and eventually found it in a new type of polystyrene. His slide frame conquered the professional and amateur world of photography for several decades.



Florjančič said that the frame was one of the most complex products he ever invented. It incorporated tens of innovative technical solutions and details, and the same number of complicated patent claims. He also developed the storage box and slide feeder. Technical Museum of Slovenia. Photo: Tomo Jeseničnik.

## HOME SWEET HOME

After coming back home to Slovenia, he often wondered what better choice in life is – to see the world or stay at home.

“If I had another life to live, I would choose the latter. It’s a lot easier and more beautiful at home. You always have friends by your side whilst when you leave for another country, you always need to start all over again. And starting all over again is difficult and painstaking.”



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# ALEŠ STROJNIK 1921-1995

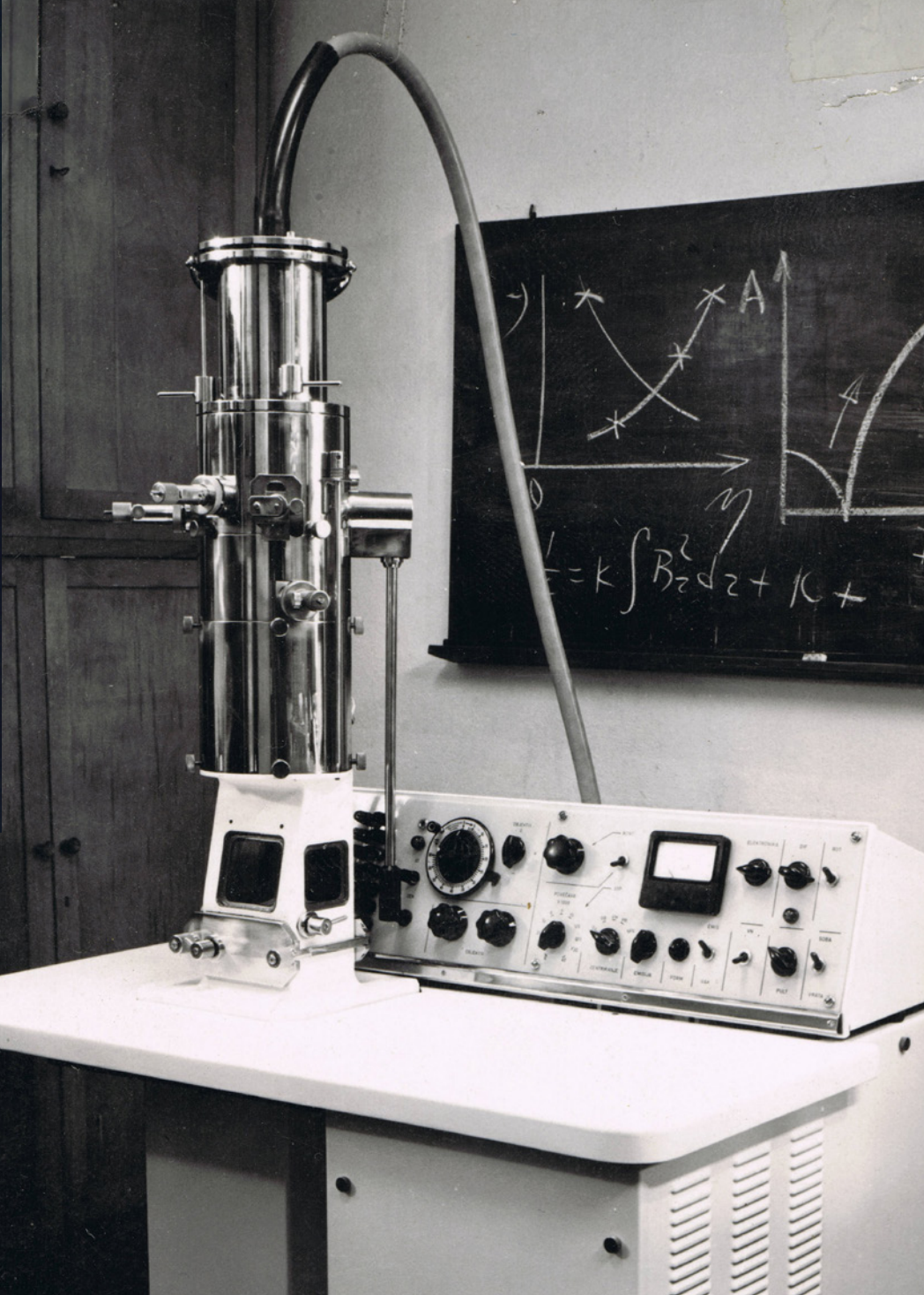
## BEYOND THE VISIBLE

Scientist, professor in physics,  
expert in aerodynamics and  
electron optics, light aircraft  
designer, author of multiple  
textbooks and a brilliant teacher.

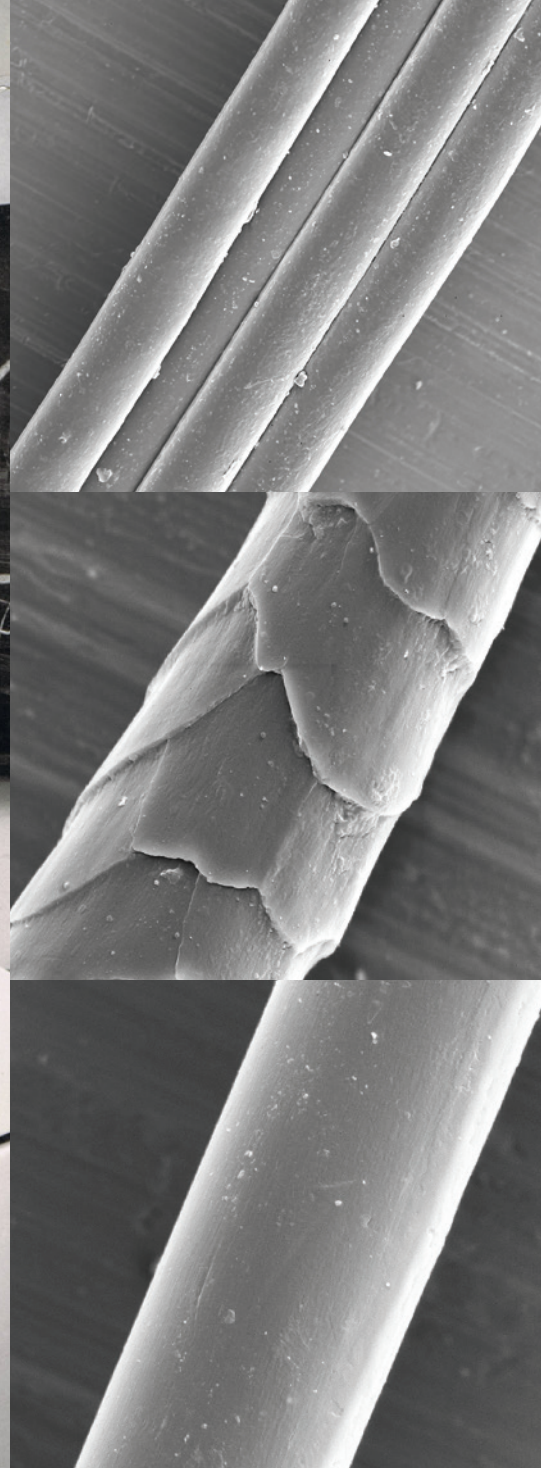


A lecture in Karlsruhe, Germany. Private Archives of Primož Strojnik, D.Sc.

Aleš Strojnik was born on 21 May 1921 in Ljubljana, where he graduated from the Technical Faculty, University of Ljubljana. He worked as an aircraft designer, then secured a position at the Faculty of Electrical Engineering. He specialized in electron microscopy at the renowned Cavendish Laboratories at Cambridge University, UK. In 1969, he accepted a position as professor at Arizona State University in Tempe. Strojnik was keenly aware of the importance of international cooperation and his career took him from Sweden and Egypt to Germany, Australia, and the U.S. He died in Tempe, Arizona, on 6 November 1995. He is buried in Ljubljana.



LEM4 electron microscope. Private Archives of Primož Strojnik, D.Sc.



Fibers of elastane, wool and polyamide under electron microscope.

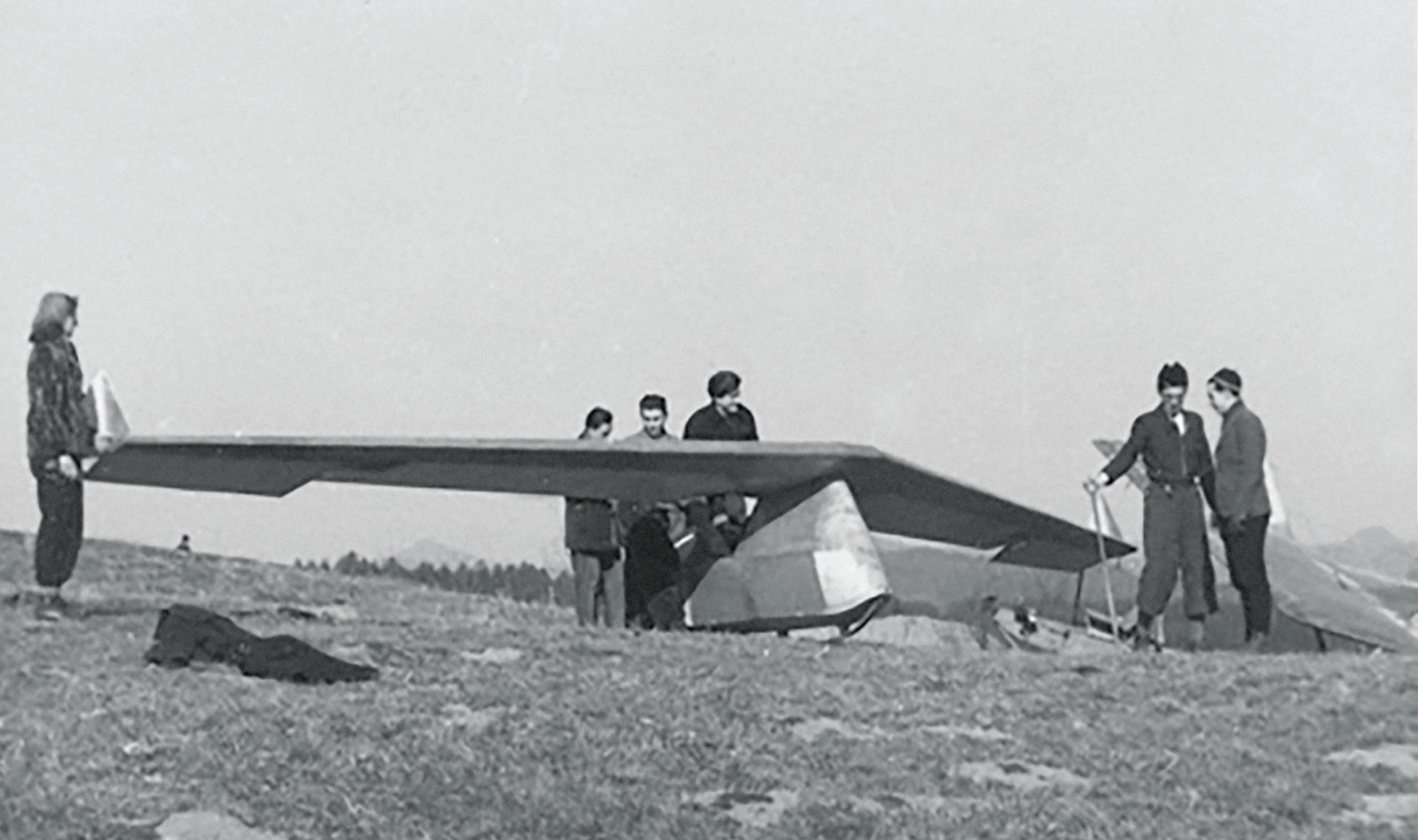
Photo: Faculty of Natural Sciences and Engineering, University of Ljubljana.

## WITH ATOMIC PRECISION

In 1955, Strojnik designed and constructed his first electron microscope in Ljubljana, the LEM1, making Yugoslavia the fifth country in the world not only to have its own electron microscope, but one that was the product of domestic

know-how. Established by Strojnik, the Electron Microscopy Laboratory would in the subsequent years produce a series of electron microscopes, named LEM1 to LEM4. The latter was the first such device in the world to be air-cooled.





Before take-off with the S1 on a hill overlooking Bokalce near Ljubljana.  
Private Archives of Primož Strojnik, D. Sc.



During a flight in his airplane. Private Archives of Primož Strojnik, D. Sc.

## PASSION OF YOUTH

After retiring, he returned to his passion for aircraft design. He designed and built multiple light aircraft and motor gliders and his S-4 even broke the world speed record in its category.





## PING-PONG MASTER

Not only was Strojnik an excellent ping-pong player, but he made his own equipment as well. He used his technical knowledge to make paddles that completely befuddled his opponents.

## TEACHING

Strojnik was appreciated by his students as an exceptional teacher and lecturer. He believed that teaching was an important duty for every professor, which motivated him to write textbooks for all the subjects he taught. His books on aviation, including popular science titles and expert works, are considered superb.



Aleš Strojnik with his daughter Marija at the 33rd Annual Meeting of the Electron Microscopy Society of America in Las Vegas, Nevada, 1975. Aleš was a session chairman and Marija delivered a paper on strongly excited magnetic lenses. Private Archives.



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Aleš Strojnik, Marija Scholl, *Physics Today*, May 1997.

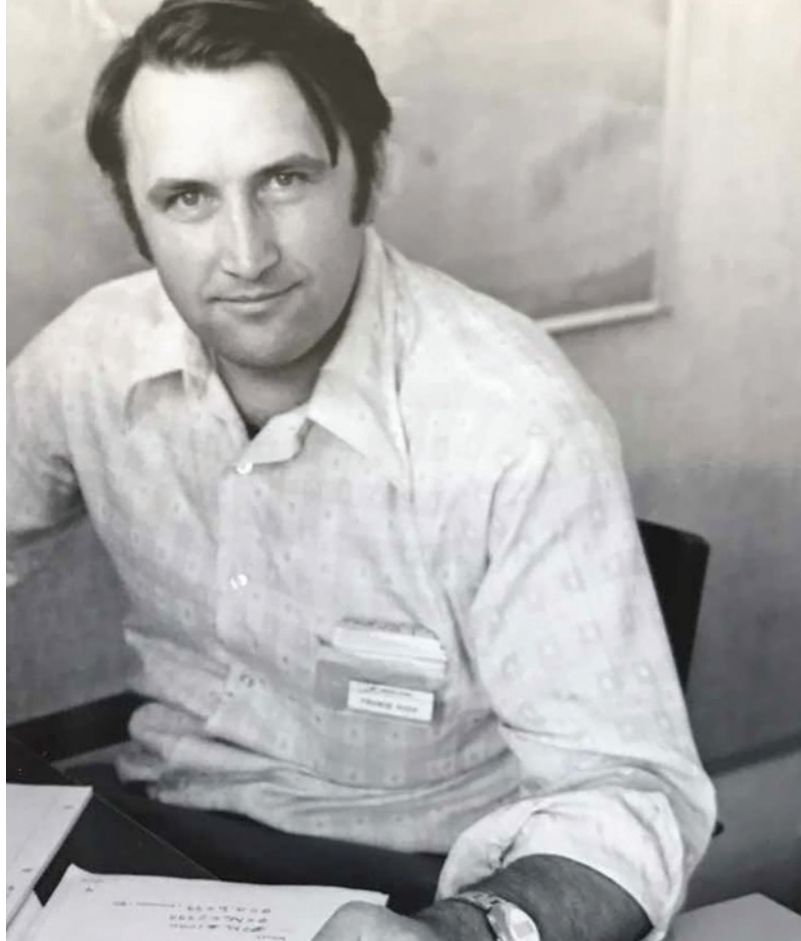
Sandi Sitar, *100 slovenskih znanstvenikov*, Ljubljana, 1987.





FRANCE  
RODE  
1934-2017

SILICON  
VALLEY  
PIONEER



Rode working at Hewlett-Packard. Private Archives.

Electrical engineer and  
inventor, entrepreneur, hobby  
woodworker, and avid tennis  
player.

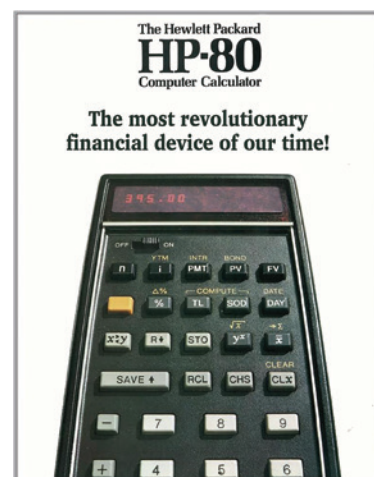
Born on 20 November 1934 into a farming family in the small village of Nožice about fourteen kilometers from the country's capital, Rode graduated from the Faculty of Electrical Engineering in Ljubljana and continued his studies in the U.S., drawn there by his secondary school sweetheart Mija, who was living with her family in Chicago and would later become his wife. In 1962, he was awarded a master's degree from Northwestern University in Illinois, whereupon he and his wife moved to Palo Alto, California, where he worked for Hewlett-Packard for almost twenty years. In 1979, he started the company Sielox with a partner, and in 1990 took a position at a satellite navigation company in Sunnyvale, CA. Nine years later he joined two colleagues in founding eRide Inc. He retired in 2008 and lived in California until his death on 7 June 2017.



Pocket calculator HP-35. Technical Museum of Slovenia. Photo: Tomo Jeseničnik.

## POCKET CALCULATOR

Rode was the lead engineer on the team that invented the first scientific pocket calculator, the HP-35, which had arithmetic, logarithmic, and trigonometric functions. Hewlett-Packard had already developed a desktop computer when William Redington Hewlett came up with the idea to create a computer that would fit in his shirt pocket. Development took a year and sales exceeded all expectations. U.S. President Richard Nixon took one with him on his first visit to China as an example of the latest American technological achievement. Soon after, astronauts took it to space, recognition of what a useful instrument it was.



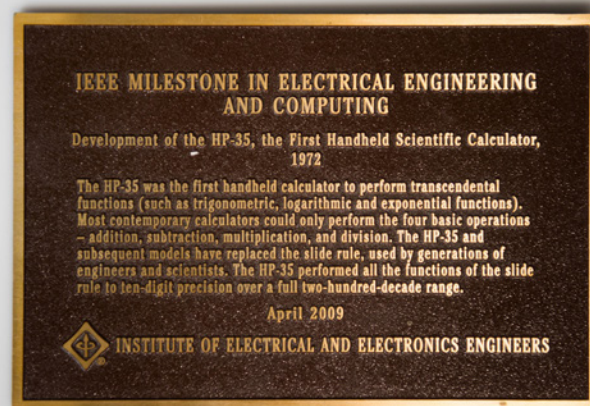
Rode worked on the HP-80 project as the project manager and lead co-inventor. He simplified financial calculations and thereby replaced the cumbersome and time-consuming tables that had been used by banks and other financial institutions. He was even prouder of this calculator than the HP-35 because he thought the project required more ingenuity and creativity. A leaflet for the HP-80. Private Archives.





At the declaration of the HP-35 as an IEEE Milestone Event in 2009.  
Private Archives.

Rode and Hewlett-Packard colleagues, with the HP-80 on the desk.  
Private Archives.

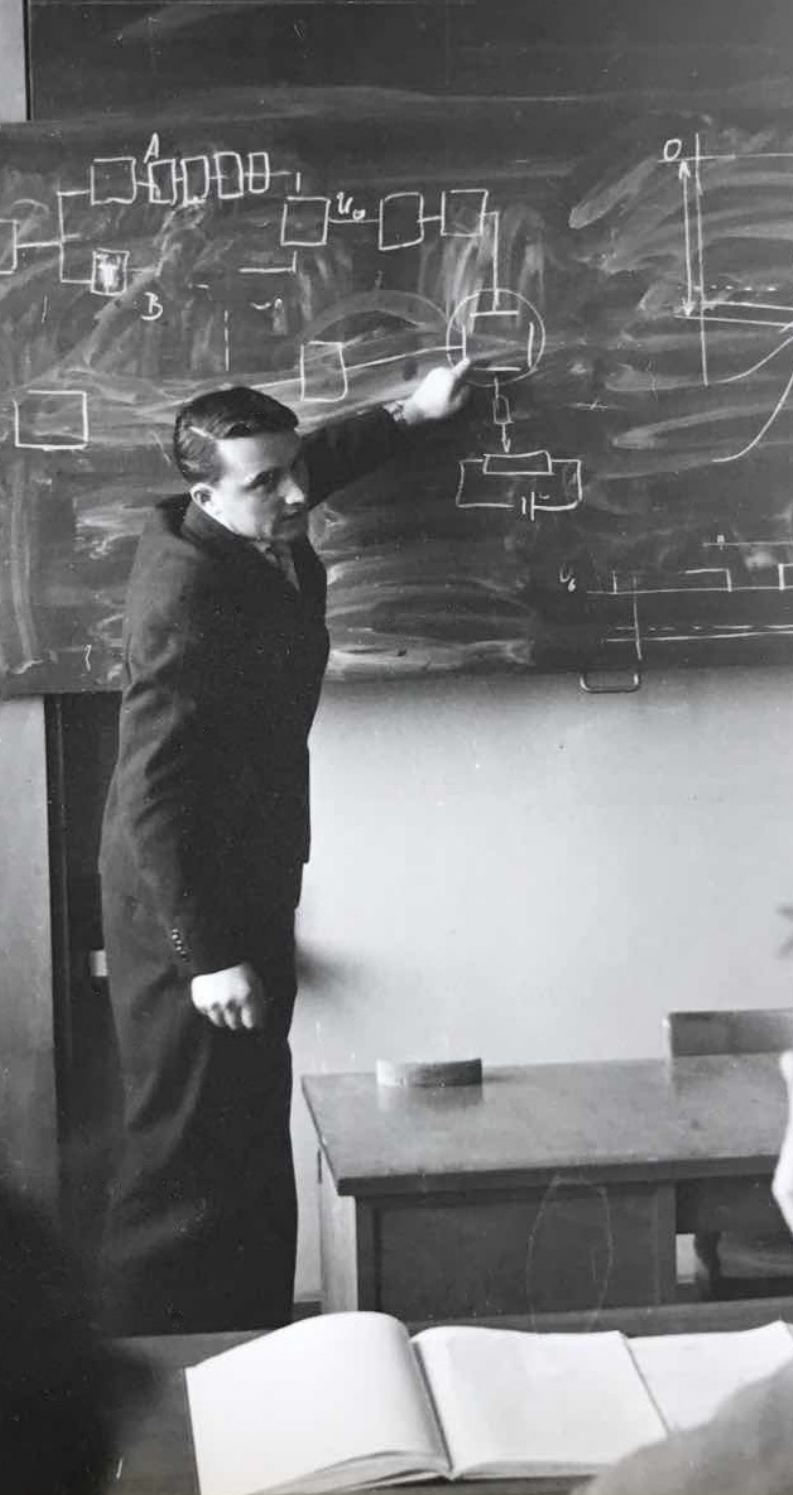


The IEEE Milestone in Electrical Engineering and Computing Award. In 2009, the Institute of Electrical and Electronics Engineers (IEEE), the highest professional authority in this field, declared the HP-35 a "milestone in electrical engineering and computing." A plaque displaying the text of the recognition has been installed in the lobby of Hewlett-Packard Labs in Palo Alto, CA. Technical Museum od Slovenia. Photo: Sanja Živković.

## INVENTOR

Rode is the holder or co-holder of 23 patents in the fields of digital electronics, computer engineering, and metrology, which are used all over the world. For example, he patented the electronic lock and participated in the development of GPS-based satellite navigation for aircraft.





Rode giving a lecture in Ljubljana. Private Archives.



Rode performing calculations with a slide rule that he made himself.  
Private Archives.

## USEFUL WOODWORKING

As a youth, Rode would spend most of his free time in his uncle's carpentry workshop, where he made toys and other useful objects that his family could not afford to buy. He made his first pair of skis, teaching aids for secondary school, the box for a radio receiver, and a slide rule that he used throughout his university studies. Many years later he would collaborate on the development of an electronic version of the tool - the HP-35 pocket calculator.



Rode's family donated to the museum his personal belongings from both professional and private life. Technical Museum of Slovenia.  
Photo: Tomo Jeseničnik.

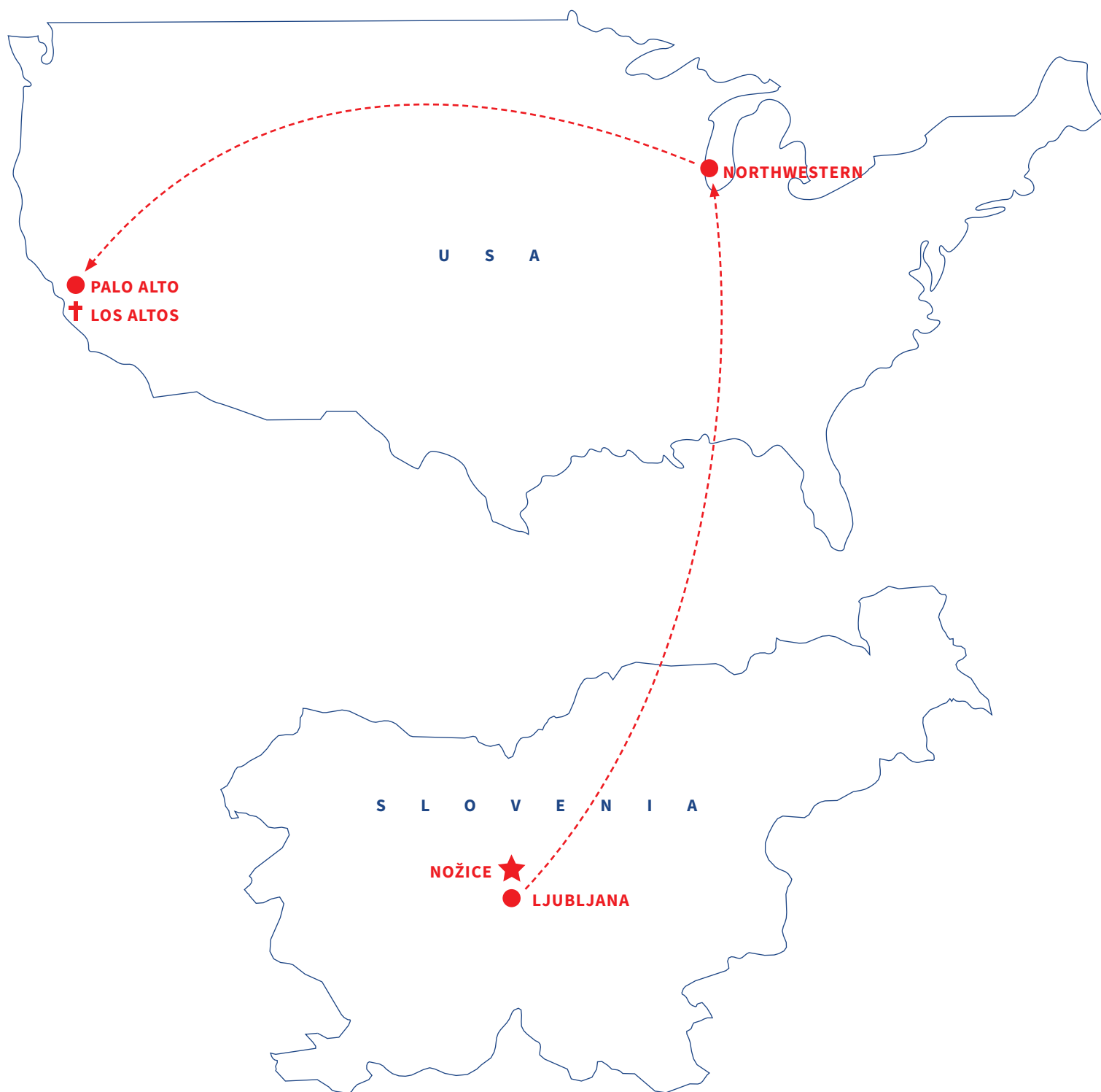


Rode's wallet. Technical Musuem of Slovenia. Photo: Nebojša Tejić, STA.

## LIFE IN A WALLET

In addition to business cards testifying to his professional career and the electronic lock that he invented, Rode always kept a dinar (currency in former Yugoslavia), a tolar (Slovenian currency from 1991 until the introduction of the euro) and a dollar banknote in his wallet, somewhat symbolizing the life of a migrant.





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Kobal, Edvard: Strast po znanju in spoznavanju : pogovori z velikimi slovenskimi znanstvenicami in znanstveniki. Ljubljana, Ustanova Slovenska znanstvena fundacija, 2003.

Interview with Rode: <https://www.youtube.com/watch?v=UUaRQ3rqvPg>

# ANTON MAVRETIČ 1934-2019

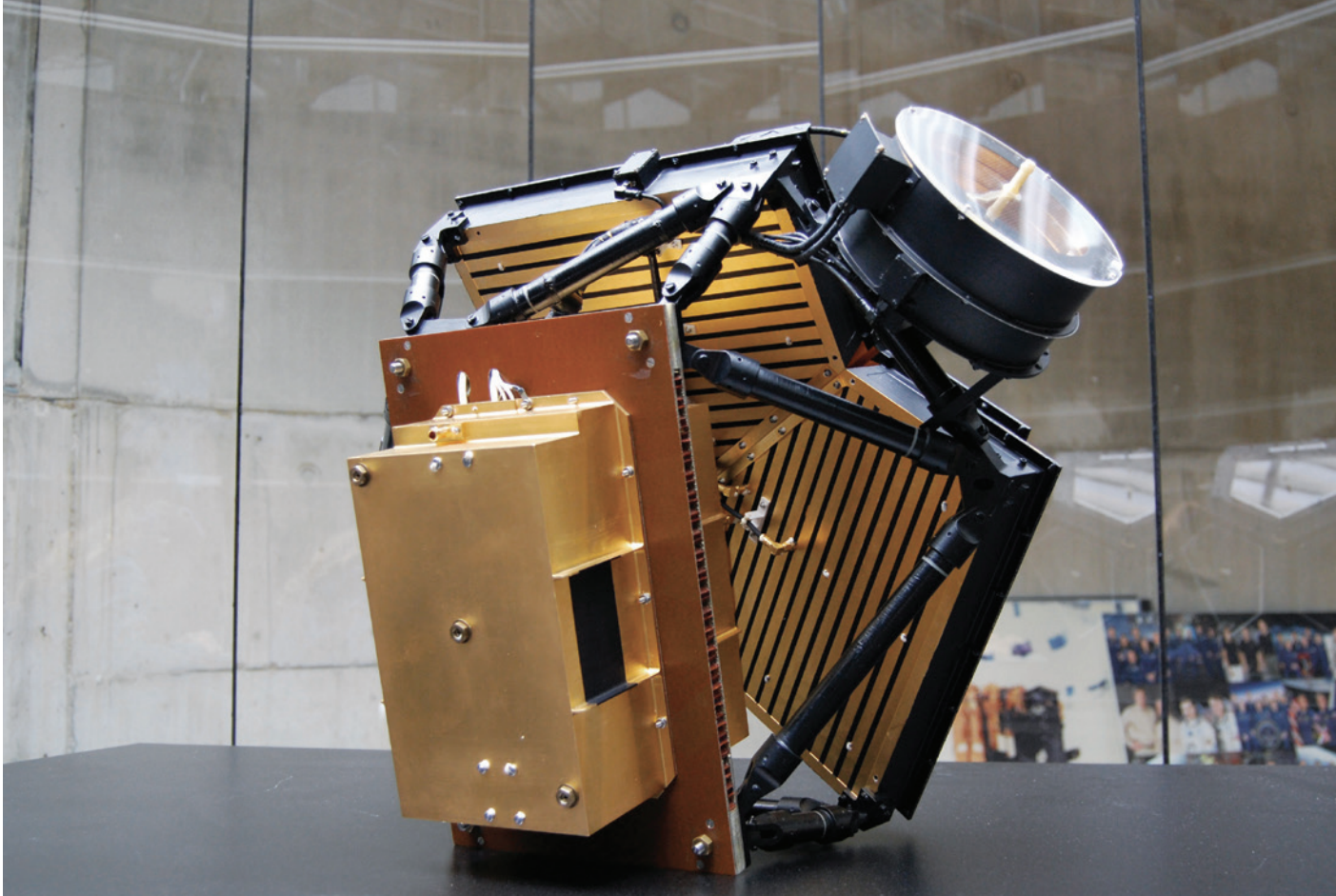
## SPACE VOYAGER

An electrical engineer involved in work on radio transmitters, analogue circuit boards, semiconductors, plasma, the solar wind, and patent arbitration procedures.



Mavretič at the Massachusetts Institute of Technology. Photo: KSEVT.

Born in the small village of Boldraž on 11 December 1934, Mavretič started studying electrical engineering at the University of Ljubljana before boarding a ship to the U.S., where he graduated from University of Denver. After a brief visit to his homeland, he returned to the Syracuse University, NY, and completed a year of PhD studies. He worked for Westinghouse in Pittsburgh the following year, whereupon he completed his PhD at the Pennsylvania State University. His last position before retirement was as a professor and research associate at Boston University's Center for Space Physics. He received multiple awards for his work on space technologies, was a lifelong member of Institute of Electrical and Electronics Engineers, and a corresponding member of the Slovenian Academy of Sciences and Arts. He died on 21 November 2019 in Boston, Massachusetts, where he is buried.



The plasma spectrometer for the Voyager space probe. Photo: KSEVT.

## THE MAN WHO CAPTURED THE SOLAR WIND

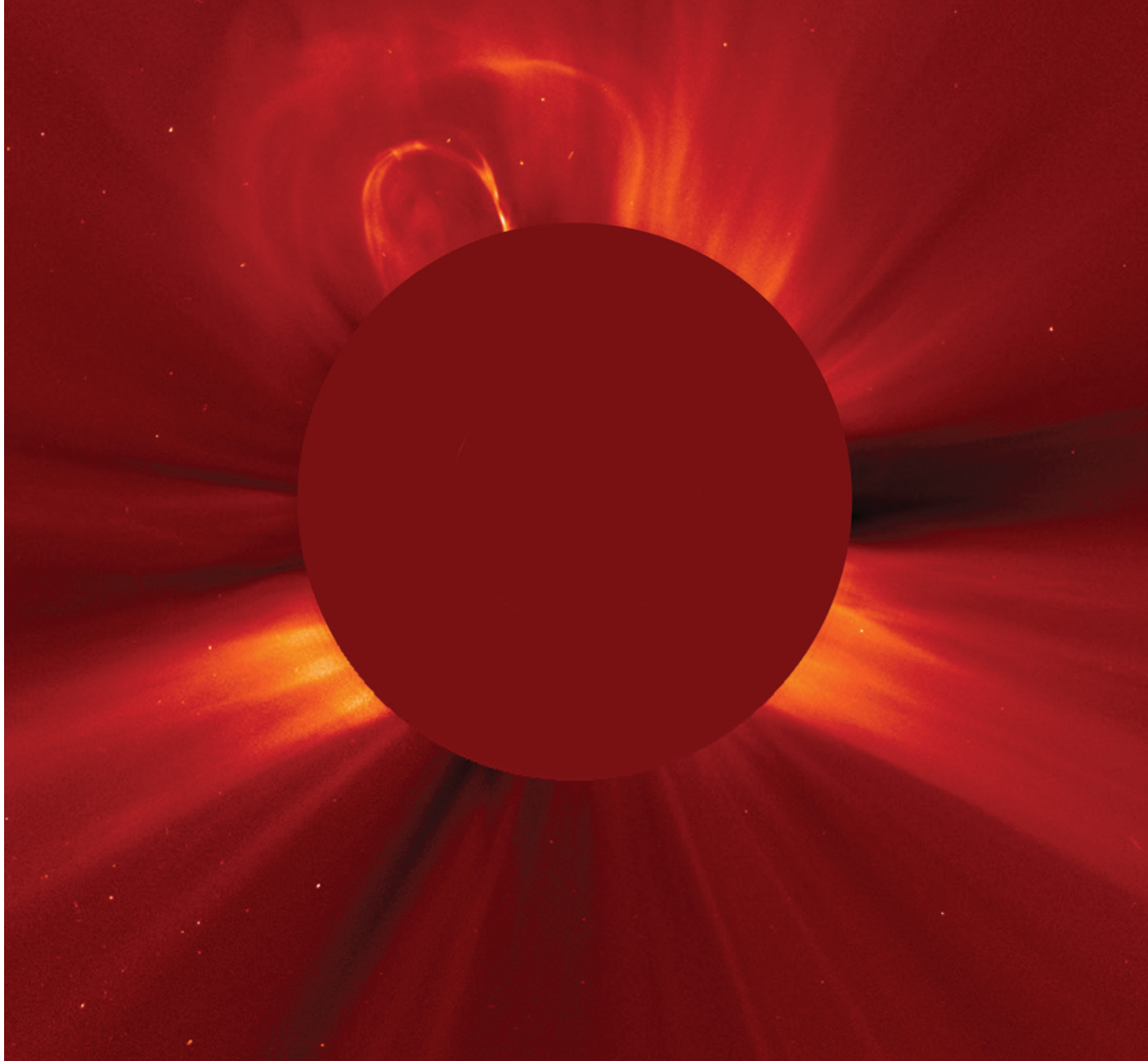
“The biggest challenge for me as a scientist was collaboration on the Voyager spacecraft.”

As a NASA contractor, Mavretič developed the electronics for a device that measures the solar wind. He worked as engineer on the project, having a critical role in the development of the plasma spectrometer. Called the PLS, it is used for measuring interplanetary plasma, the solar wind, and the composition of planetary atmospheres in the Solar System. One of the most

important instruments humans have ever sent into space, the PLS has played a crucial role in the exploration of deep space by the Voyager 1 and Voyager 2 space probes, whose objectives included up-close investigation of the gas giants beyond the asteroid belt and, ultimately, the determination of the Solar System’s boundary. On 25 August 2013, Voyager 1 became the first man-made object to pass this boundary; if not for the PLS, the data demonstrating this achievement would never be obtained let alone analyzed.

The solar wind is a simplified term for the stream of charged particles – particularly protons and electrons – emitted by the Sun into interplanetary space.





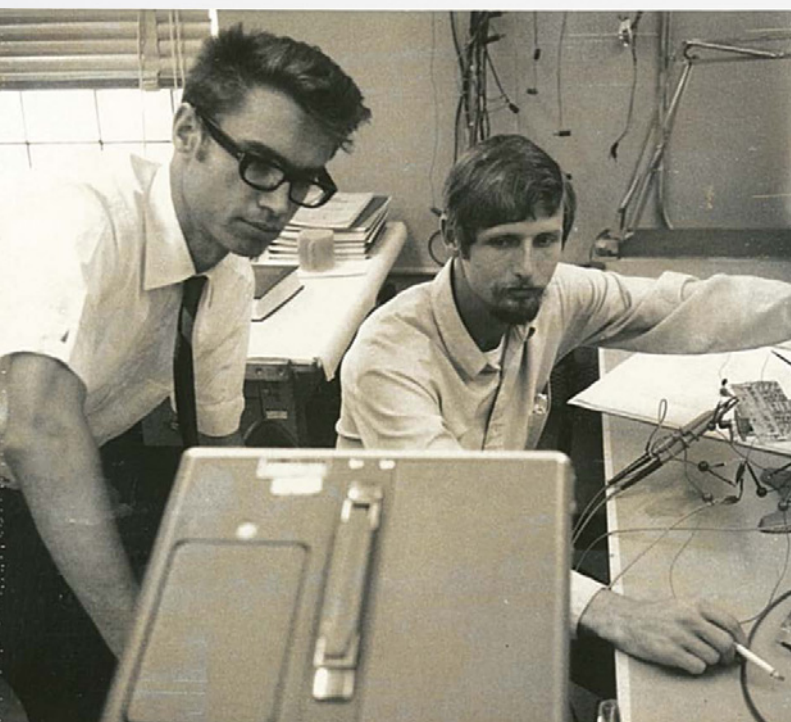
The solar wind. Photo: NASA/SOHO.

## KNOWLEDGE BELONGS TO EVERYONE

In 2013, Mavretič donated several hundred kilograms of his research materials to the National and University Library in Ljubljana, sending a profound message in support of the accessibility of knowledge. In a world in which scientific achievements and patents, in particular advanced technologies, quickly fall prey to private interests, he wanted to make his findings freely available to future generations of students and researchers. It is humanity as a whole that has every right to lay claim to knowledge, not the profit-making corporations.

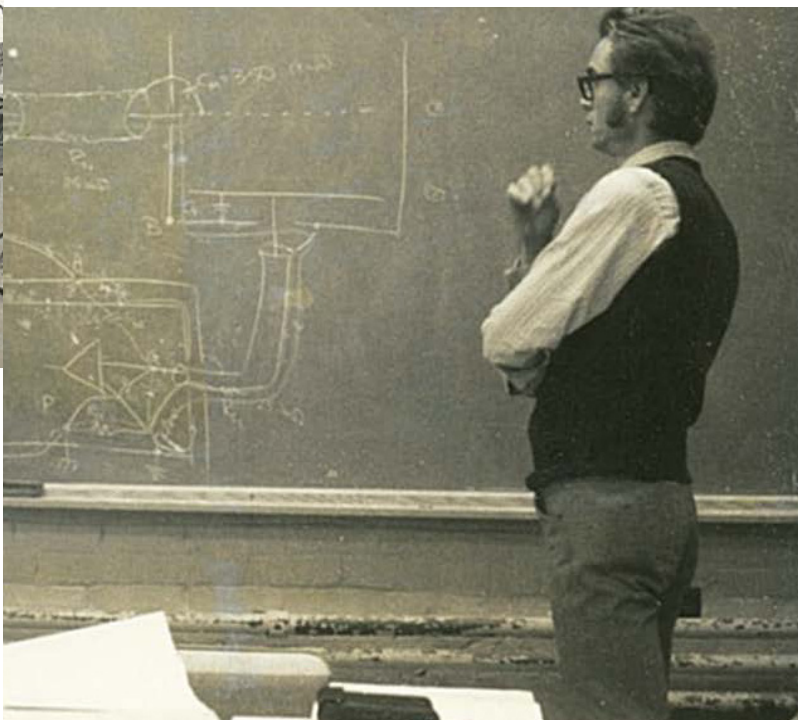


Technical Museum of Slovenia is delighted and honored that Mavretič and his family donated several personal objects and some related to his work on Voyager and Explorer. Photo: Tomo Jeseničnik.



At MIT, Mavretič developed plasma spectrometers for the Voyager missions and the Interplanetary Measuring Platform (IMP). On the picture, working with his assistant, mid-1970's. Private Archives.

Mavretič delivering a lecture at MIT. Private Archives.







Inscription on the plasma spectrometer. Photo: KSEVT.

## FOR EVER

As a project engineer, Mavretič's name appears on a golden plate attached to the PLS instrument, which is still travelling deep in interstellar space. Even when Earth is gone, it will continue to travel through space aboard the Voyager time capsule, carrying the name of the Slovenian scientist some call the new Noordung.

## LIGHT

Soon after the Second World War, when Mavretič was 12, his native village became one of the first settlements in the region to be electrified. He recalls how the magnificent light of the electric bulb inspired his choice of career.





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Voyager 127AU/Dr. Anton Mavretič. <http://4d.rtvsl.si/arhiv/dokumentarni-filmi-in-oddaje-kulturno-umetniski-program/174301643>

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Interview with Dr. Anton Mavretič on Radio Študent. <https://radiostudent.si/kultura/milo-rase-vitica/anton-mavreti%C4%8D>

Vaš krog Anton Mavretič. <https://www.youtube.com/watch?v=1gvwKISsA14>

Mission of Voyager 1 & 2 space probes. SLO Science Festival 2013. <https://www.youtube.com/watch?v=gaHnKiClIM4>

# MARIJA STROJNIK 1950

## PLANET HUNTER

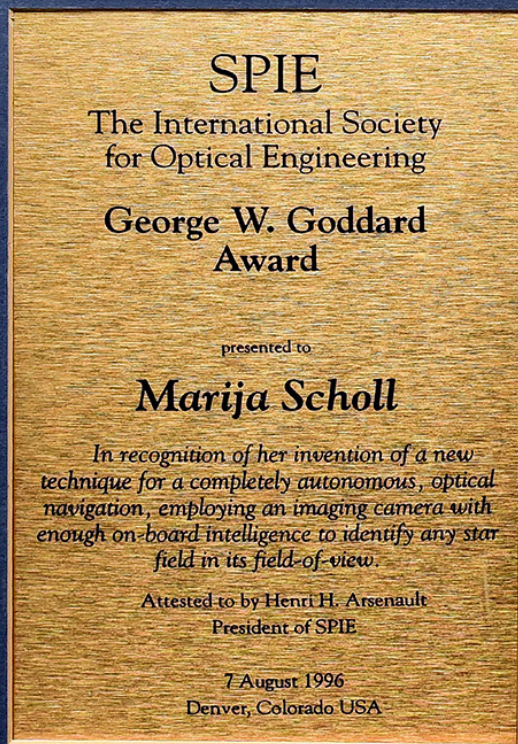
Optical physicist, infrared  
radiation specialist, editor  
and professor.



Strojnik participating at the 23rd Slovenian Science Festival in Ljubljana.  
Photo: Sanja Živković.

A native of Ljubljana, Marija Strojnik was born on 13 July 1950. She started studying physics at the University of Ljubljana and completed her studies at Arizona State University in Tempe, AZ. While there, she collaborated with her father Aleš Strojnik, who was building an electron microscope. She took a master's degree in physics, optical sciences, and engineering, and in 1979 became the first woman to receive a PhD in optical sciences from the University of Arizona in Tucson.

After working at Rockwell International (later sold to Boeing) in Los Angeles and then at Honeywell in Phoenix, she took a position at the California Institute of Technology, which is also an official NASA center. She is currently a lecturer at the Optical Research Center in Leon, Mexico, focusing on discovering exoplanets, i. e. planets outside our Solar System. She has designed a special instrument for the optical detection of planets next to a bright star.



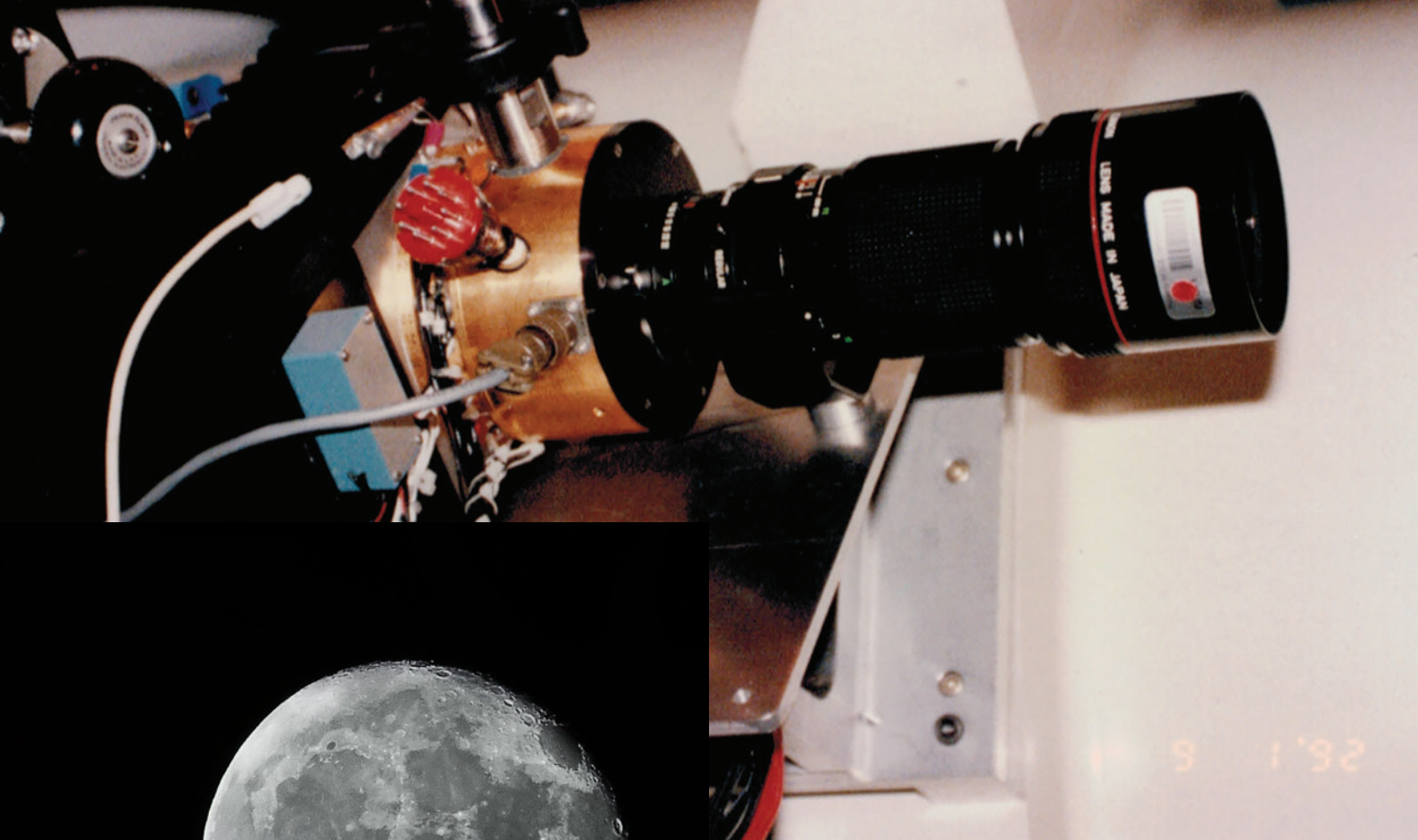
The prestigious George W. Goddard Award, 1996. At the time, her surname Scholl was taken after her husband. Private Archives. Photo: Tamino Petelinšek, STA.

## CASSINI MISSION

She is best known for developing an autonomous technique for optical navigation, which remains one of the fundamental methods for determining location and orientation on and around Earth. With the help of star charts, an intelligent CCD camera, and a computer calculating directions based on an algorithm she developed, spacecraft became independent of Earth-based calculations. The technology was first deployed on the Cassini mission to Saturn.

For this invention, the International Society of Optics and Photonics bestowed on her the prestigious George W. Goddard Award in 1996. She was the first woman to receive this accolade.





A charge-coupled device (CCD) camera with a light-sensitive electronic detector that Strojnik uses for her work, 1992. Private Archives.

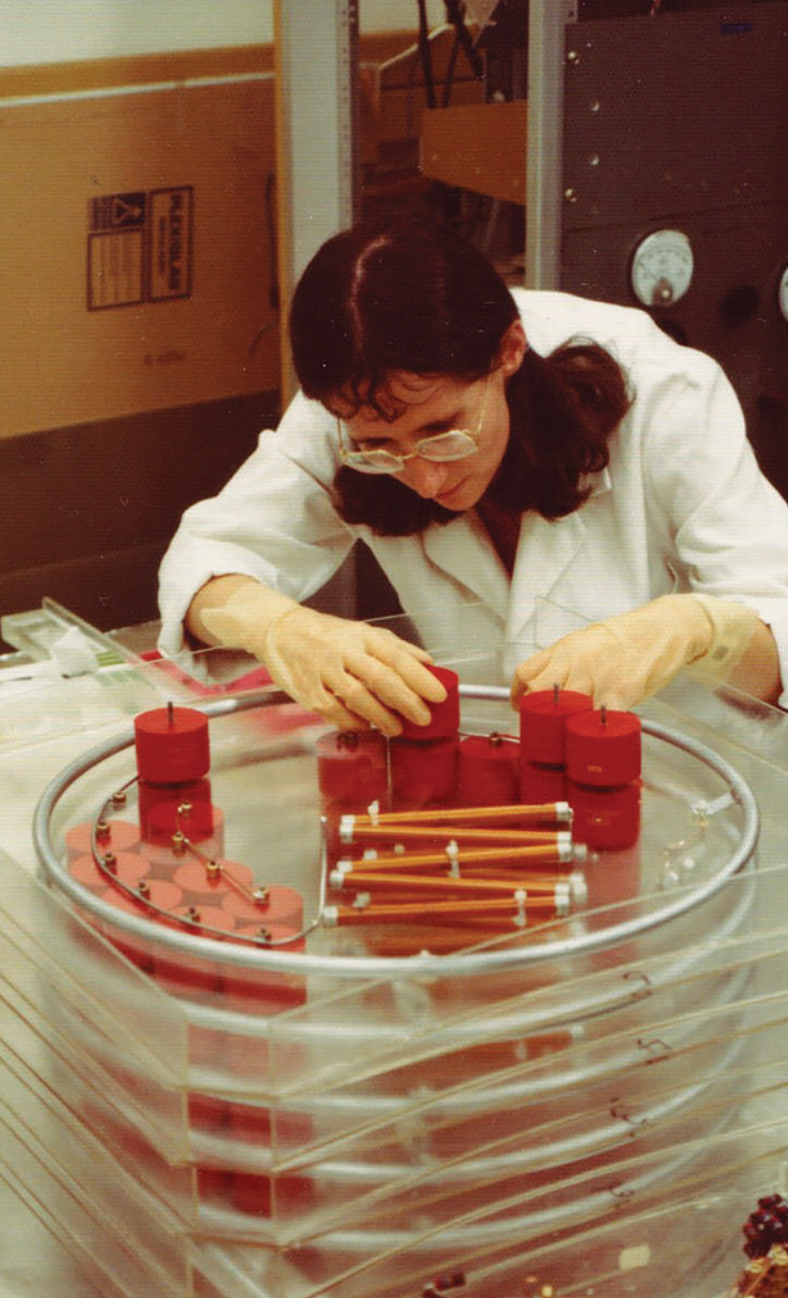


The Moon. Photo: NASA.

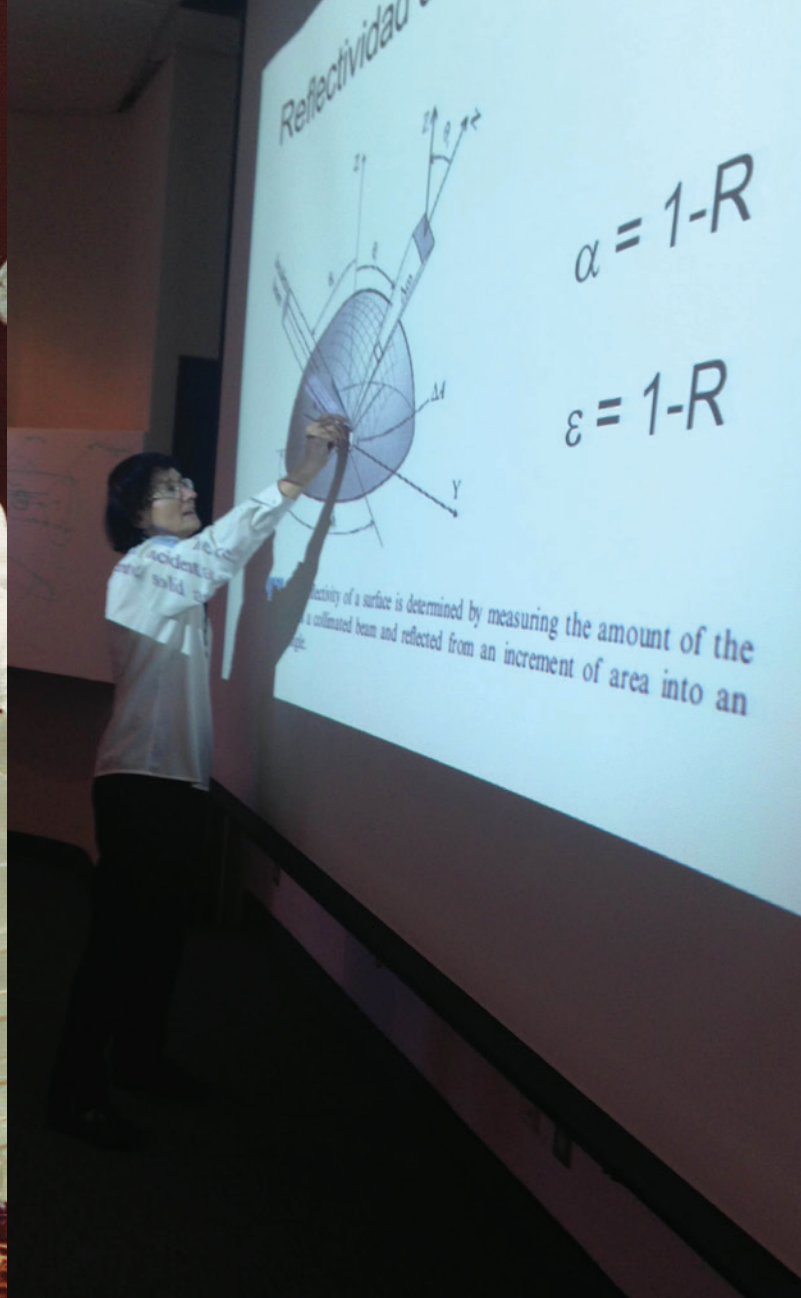
## MEMORIES OF THE FIRST LANDING OF MAN ON THE MOON

“When that summer of 1969, as a nineteen-year-old girl in Ljubljana I watched the documentaries and interviews about the landing of a man on the Moon, I was stupefied with admiration for the greatness of the project. I realized and apprehended that this was not an achievement of a single genius, but the result of a successful collaboration of many people, people just like you and me.

Even more than in the first man’s step on the Moon, I was curious about how they got there. I watched the engineers who worked on the project on television. Physicists on television spoke about gravity, the concept of weightlessness that we didn’t really understand at the time. All of this had a tremendous influence on my life. I just enrolled in the first year of the study of physics, without slightest intention to explore the universe. Also, because it was all happening far away in America. Surprise, surprise! Two years later I was studying in the U.S. and in eight years I was working for a company actively involved in space research.”



At work in the laboratory, 1975. Private Archives.



Lecturing at the Optical Research Center in Leon, Mexico, 2016. Private Archives.

## IN A MAN'S WORLD

Despite a “traditionally girl-oriented upbringing”, she displayed an interest in science. She would help her father Aleš, an electrical engineer, from an early age and learnt a great deal about physics and optics. At the age of 14 she even built a transistor radio.

She had been the only female student in a department with 60 physicists, “living in a man’s world all her life: from growing up with four brothers to being the only or the first woman in many situations”.





Marija Strojnik donated her PC to the museum in 2020. Technical Museum of Slovenia. Photo: Tomo Jeseničnik.



Marija Strojnik with her father Aleš in Ljubljana, around 1955. Photo: Private Archives.

## PARTNER IN KNOWLEDGE

This computer was in service of knowledge for nearly two decades. Strojnik used it in her

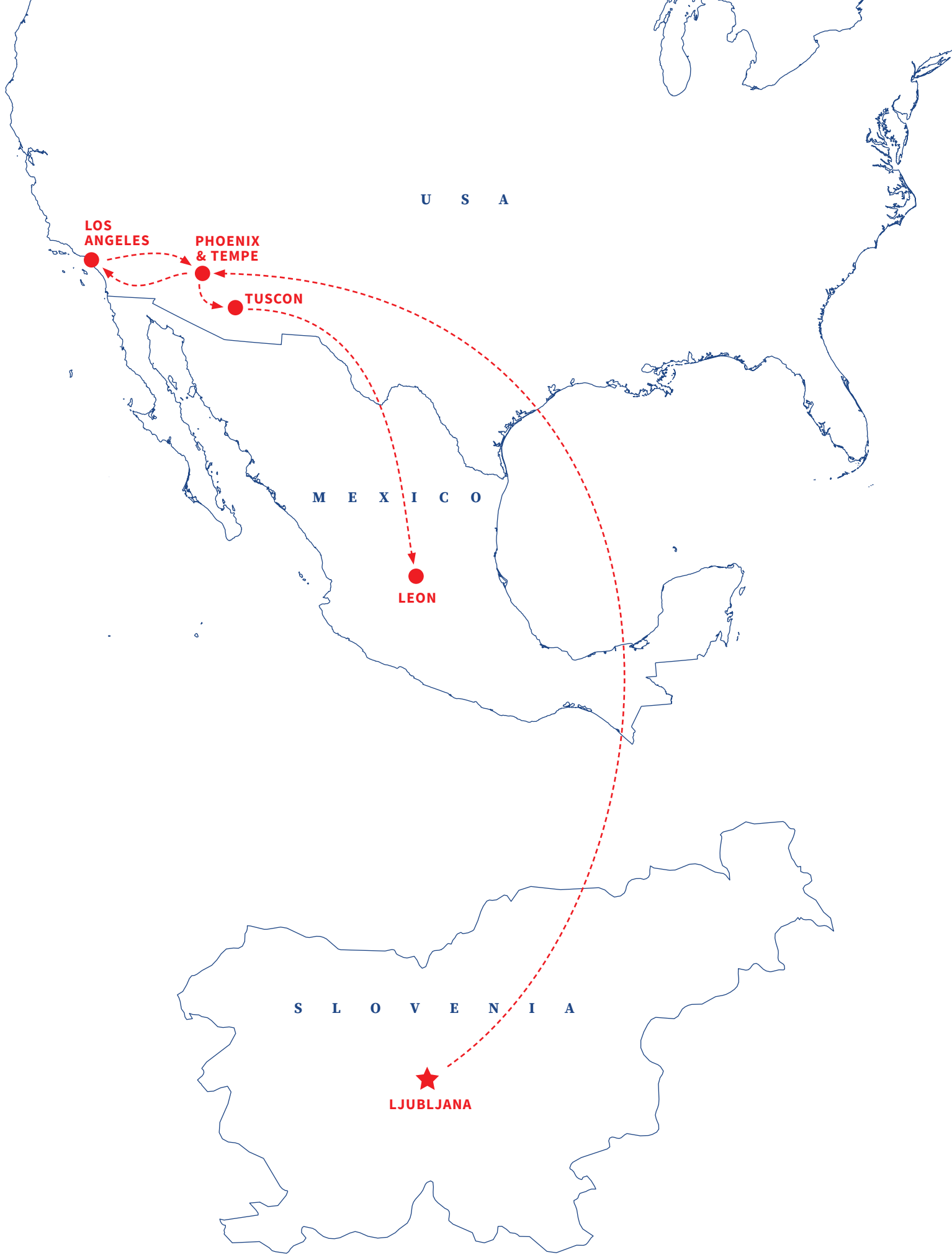
professional work, meaning it was a repository of everything she ever studied, learnt, researched and discovered.

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# SUNITA L. WILLIAMS 1965

## SPACE WALKER



Sunita Williams in a spacesuit. Photo: NASA.

Pilot, officer, prominent astronaut with several International Space Station records, one of the few people to have been in space more than once.

Born in Euclid, Ohio, on 19 September 1965 to an ethnic Indian father and a mother descended from Slovenian immigrants, Sunita L. Williams grew up in Massachusetts and attended the Naval Academy in Annapolis, where she graduated in physics. She trained to be a helicopter pilot and became a test pilot for different types of aircraft. In 1995, she completed a master's degree in engineering management at the Florida Institute of Technology. After visiting the space center in Houston and meeting with astronauts, she decided to pursue a career in space exploration. Williams was selected for astronaut training by NASA from among several thousand applicants and became a part of their astronaut team.



## SUIT FROM SPACE

Upon visiting Slovenia in 2013, she donated the jumpsuit to the people of Leše, a village near Tržič where her mother's family hails from. It is kept in the "Sunita L. Williams Memorial Room". Williams visits it whenever she is in Slovenia. The memorial room has been created by the Institute of Slovenian Astronauts, which promotes the astronaut profession. Her great wish is that someday a Slovenian will follow in her footsteps.



The jumpsuit that Williams wore as the commander of two expeditions to the International Space Station in 2012, Expedition 32 and Expedition 33.  
Photo: Sanja Živković.

## INTERNATIONAL SPACE STATION

While staying at the International Space Station, she conducted scientific experiments and concurrently repaired and upgraded the station in open space. She was entrusted with operating the robotic arm, an assignment in which she was able to leverage her physics and engineering know-how.

Her extraordinary persistence and resourcefulness enabled her to set several records. With 195 consecutive days spent at the International Space Station, she was the record holder among female astronauts until June 2015. In total, she spent 321 days or almost 11 months in space. Until 2017, she also held the women's record with seven space walks and a total of 50 hours and 40 minutes of extravehicular activity.





Carrying out repairs on the outside of the International Space Station.  
Photo: NASA.



Exercising at the International Space Station. Photo: NASA.

## SPACE VERSUS EARTH

Sunita and her older sister Dina are keen marathon runners and have both been competitive from an early age. They even did a marathon while she was in space: while Dina ran in the streets of Boston, Sunita ran on a treadmill at the space station and due to more favorable conditions she beat her sister on Earth.





The International Space Station. Photo: NASA.

## A PERSPECTIVE FROM SPACE

“Every trip is more about discovering yourself than other places. And for some reason, it takes all this technology for us to come up here and understand the simplicity of things. From up here, it is really difficult to understand borders, wars, and hate!”

Sunita Williams

## SAUSAGE IN SPACE

One of her favorite memories of her stay on the International Space Station between December 2006 and June 2007 was the time spent with the Russian cosmonauts during dinner. On one such evening she shared with her Russian colleagues a Kranjska sausage, a signature Slovenian dish, which her mother had sent her. But before the sausage managed to fly to space, the butcher Bill Azman from Euclid (Williams' birthplace) received an interesting call from NASA: “They wanted to know the sausage ingredients. I told them it’s a very simple recipe, just salt, pepper, garlic and pieces of pork. They were interested because the space station doesn’t have a physician. Had the sausage contain any allergens, it could be a real disaster.” Azman was also requested the recipe in writing.



Honorary members of the Slovenian Engineering Academy – France Rode (since 2017) and Sunita Williams (since 2014). Archives of the Slovenian Engineering Academy. Photo: Marjan Smerke.

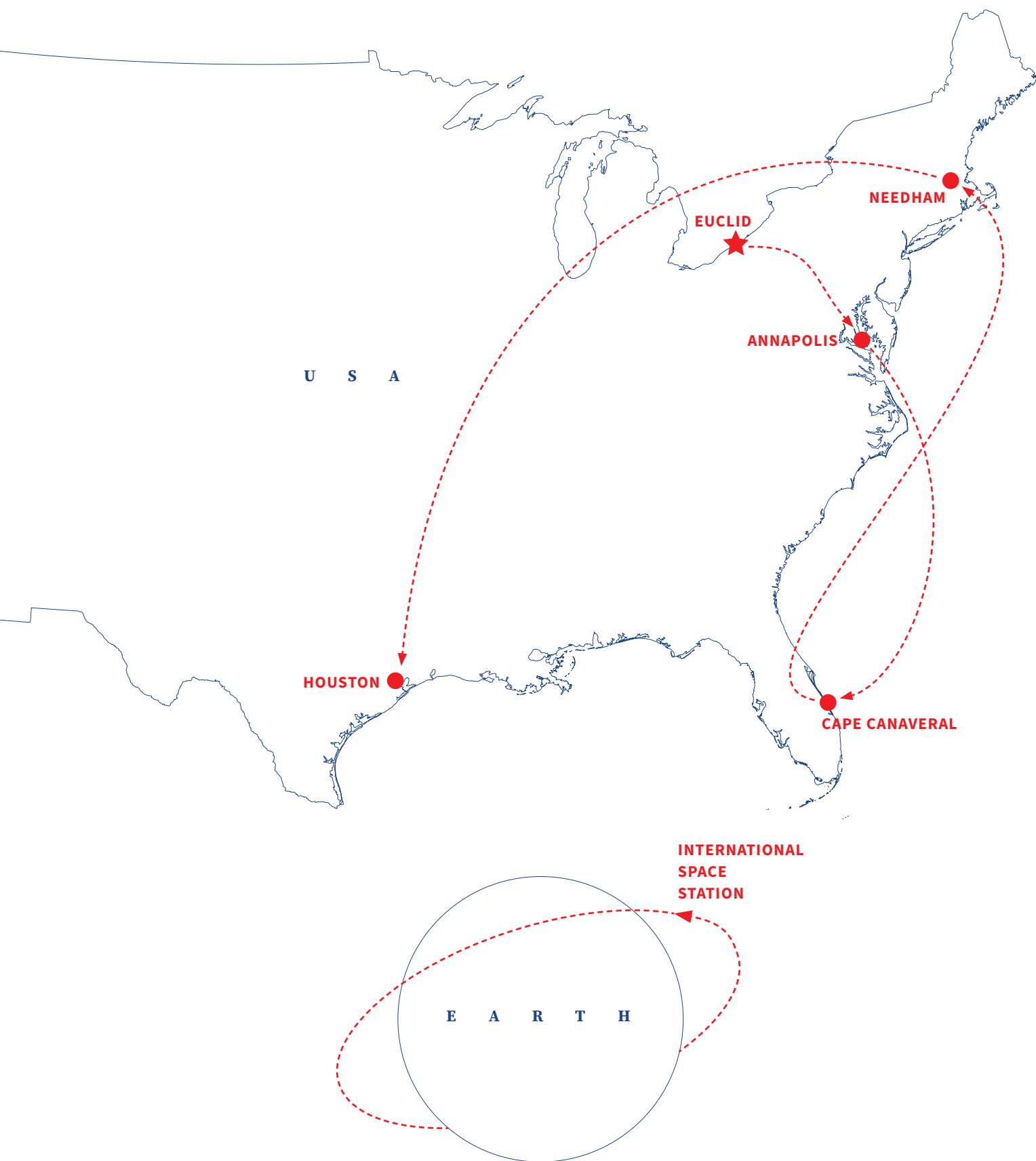


Williams and her mother with Peter Florjančič, during their visit to Slovenia in 2013. Photo: Tibor Zavrl.

## IT'S A SMALL WORLD

It is a common “knowledge” that in Slovenia not only we all know each other but we are often related. Here is a proof. Williams and Rode met and took a picture together, while with Florjančič – guess what. They are relatives, for real.





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# APPENDIX

Slovenian Immigrant Community in the U.S.  
from Past to Present: **Alenka Jerak**

Technical Museum of Slovenia: **Ajda Kozjek,**  
**Melita Silič, Urša Vodopivec**





# SLOVENIAN IMMIGRANT COMMUNITY IN THE UNITED STATES FROM PAST TO PRESENT

Over the last three centuries, many Slovenians were swept by modern European and global waves of migration, leaving their homeland and settling in different parts of the world. Emigration from the Slovenian ethnic territory to the United States was at its high before the First World War, in the interwar period, and in the 1960s and '70s. It has continued to this day, although in substantially smaller numbers.

Slovenian women and men moved across the big pond for a variety of reasons. In the second half of the 19th century and in the 1960's and '70s, they mainly left for economic reasons, while post-WWI and WWII migrations were provoked by the political situation in the country. Slovenian intellectuals engaged in science, art or culture were often motivated by better economic and work conditions, career opportunities or reputation, which is also the case with the current immigration of Slovenians to the States.

The first to come were the Protestants who emigrated during the Slovenian Counter-Reformation in the 17th century, followed by Catholic missionaries engaged in religious work among the native tribes in Minnesota, Michigan and Wisconsin.

Immigration was massive between 1870 and 1924, which was the period of rapid development of industry and mining. In 1924, the U.S. placed severe restrictions, establishing a quota system that limited immigration from southern and eastern Europe. However, not even strict legislation could stop people from abandoning their homes to live the American dream.

Due to fertile soil, developed industry and mining, Slovenian immigrants mostly settled in the northwestern and midwestern part of the U.S. Their destination depended on a variety of factors, such as accessibility, period of immigration, eventual Slovenian immigrant settlements, climate. They worked in mining, steel and ironworks, agriculture and service

industries (trade, catering, travel agencies). Some became successful businessmen.

Most immigrants lived in ethnic settlements, i.e., parts of towns or cities with a large enough concentration of Slovenians, and at least one of three ethnic organizational structures: a benefit society or fraternal organization, a national home or a Slovenian Catholic or Evangelical ethnic parish which organized Slovenian schools.

The largest Slovenian communities were formed in western Pennsylvania, northeast Ohio, Great Lakes region and upper Michigan, Great Lakes region of Wisconsin, central Illinois, Indiana, and central and northern Minnesota. Brockway (today St. Stephen's) was one of the oldest Slovenian settlements in the States. In 1920, Cleveland (Ohio) was claimed the third largest "Slovenian city", second only to Ljubljana and Trieste.

Established before and during WWI, fraternal benefit organizations were a fundamental form of organization of Slovenian immigrants in the U.S. They provided insurance in the event of occupational accidents or illnesses and supported cultural activities. Composed of individual lodges across the States, some have been active to this day: American Slovenian Catholic Union (ASCU), Joliet, Illinois (1894), Slovene National Benefit Society (SNBS), Imperial, Pennsylvania (1904), and American Mutual Life Association (AMLA), Cleveland, Ohio (1910). In the early 20th century, these organizations started building recreation centers in the rural areas: SNBS in Kirkland (Ohio) and Enon Valley (Pennsylvania), which also has a Slovenian heritage center. Post-WWII immigrant community built Slovenska pristava (Ohio) and Triglav park (Wisconsin). Of some thirty-tree Cleveland Cultural Gardens, one is Slovenian.

Other important organizations include the Slovenian Union of America (former Slovenian Women Union of America, Joliet) and the Slo-



Slovenian immigrants visiting their former homeland, 1950s. Photo: Slovenian Emigration Association.



Before leaving for the USA from the Port of Trieste, 1950s. Photo: Slovenian Emigration Association.

venian Research Center of America (Cleveland) with an extensive archive of successful Slovenians in the U.S. (in part, it was transferred to the Archives of the Republic of Slovenia).

Slovenian National Homes (*narodni dom*) also had a significant role in the formation and organization of the Slovenian immigrant communities. They were built by volunteers who shared a concern for the fate of their old homeland. In Cleveland alone, four such homes were opened in 1919, followed by the largest in the United States, built on St. Clair Avenue in 1924, which has served the Slovenian community to this day. It has a main hall with 1,350 seats (the stage curtain is a piece of art reproduced from 1924 painting *Mother Slovenia* by Maksim Gaspari), a library with a reading room and a boules court. For years, the center housed eleven offices, seven shops, a Sokol gymnastic society's hall, a Slovenian school, several choirs, a drama school, a travel agency, a photo studio, a Slove-



Car for the transport of sick children donated by the Slovenian American National Council (USA) to the children's home in Ljubljana, 1950s. Photo: Slovenian Emigration Association.



Three thousand people showed up at the Leroy (Ohio) concert of the Lojze Slak Ensemble, held on 7 September 1970. Photo: Tomo Jomišič, Slovenian Emigration Association.

nian national museum and many associations. It was also the headquarters of the American Mutual Life Association for some time. This kind of a community center with related commercial, social and cultural venues was a model for other national homes of the Slovenian immigrant community in the States. Today, it houses the Slovenian archives and museum, and the Slovenian International Genealogy Society. It is also the place where the United Americans for Slovenia was founded in 1991. Through communication strategies and events, the organization appealed to the then administration for recognition of independent Slovenia.

Ethnic parishes were a distinctive form of immigrant organization. The Catholic Church supported their establishment in the late 19th century to prevent the immigrants' loss of faith. The first two Slovenian parishes were founded in

St. Stephen's (former Brockway) and Tower (Minnesota) in 1871. As many as thirty-two Slovenian parishes existed in the U.S. in 1924, acting as the core of religious, cultural and social life of immigrants. Slovenian language was taught at the parochial schools to maintain national identity of the incomers and their descendants. Today, religious service and Saturday school in Slovenian are held in St. Vitus (the largest Slovenian parish in the U.S.) and St. Mary parishes in Cleveland, and the Slovenian Catholic Mission in Lemont. Slovenian Protestant parish in Bethlehem (Pennsylvania) and St. Cyril Church in New York are still active as well.

Ethnic newspapers, periodicals and radio shows were instrumental in maintaining national identity of the immigrant community members. Some are still published/broadcast; a few both in Slovenian and English, and a majority just in English to accommodate younger members of the community. Cleveland is also known for the National Cleveland-Style Polka Hall of Fame and Museum.

In addition to Slovenian organizations, we cannot forget sons and daughters of Slovenian immigrants who grew into successful entrepreneurs, politicians (mayors, governors, members of the United States Congress and even presidential candidates), scientists, culture professionals, innovators, artists, high-ranking military officers, astronauts, physicists, mathematicians, biologists and philosophers. With their achievements, they contributed to the progress and welfare of the U.S. Some are portrayed at the *Us and Them without Frontiers* exhibition by the Technical Museum of Slovenia.

Compared to the "old times", modern migration of Slovenians to the U.S. (mostly young entrepreneurs, scientists, researchers, artists, medical doctors and IT professionals) is a completely different story. They settle in "non-traditional" parts of the USA (California, New York, Florida),



they organize in a completely different way (mainly through social media), and their social and other activities are interest-based. Many are associated within the American Slovenian Education Foundation, which enhances Slovenian education and research activities, the VTIS Association of Slovenes Educated Abroad, and other institutions (Fulbright Program, Kerže Funds).

All immigrants and their offspring have many possibilities to learn or practice Slovenian language. In addition to newspapers and radio shows, Saturday language schools and Sunday religious services, they can attend online Slovenian classes provided by some universities (lectureship of Slovenian language at the Cleveland State University organized by Center for Slovene as a second or foreign language, Faculty of Arts, University of Ljubljana), summer schools of Slovenian in Slovenia, etc.

To sum up: the fabric of the Slovenian ethnic community in the United States changed over time. In the early 20th century, the community was mainly composed of generations born in Slovenia, whereas today, the generations born in the USA, who are U.S. citizens, account for nearly 90%. However, they ever more intensely, especially after Slovenia's independence and now, in the time of crisis and pandemic, explore and manifest their Slovenian origin and roots, while at the same time repositioning the notion of national identity to other fields, such as culture and cultural heritage, music, dance, customs and traditions, and traditional food and cooking.

Modern technology, in particular the Internet and social networks, allow Slovenian immigrant community in the U.S. to establish closer relations with Slovenian ethnic communities in other parts of the world as well as with their motherland.

Based on U.S. census data, 123,631 individuals, born in Slovenia, and 59,800 people born in the USA reported Slovenian as their mother tongue in 1910. In 1920, the number of Slovenian immigrants amounted to about 228,000.

In the 1990 census, barely 124,437 individuals (0.05% of the entire U.S. population) acknowledged their Slovenian origin, of which only 87,500 reported Slovenian as their primary ethnic identity. In the 2000 census, the number of individuals acknowledging their Slovenian ethnicity totaled 175,099.

There are an estimated 250,000 to 300,000 people of Slovenian descent living in the U.S. today, of whom 75% in six states: Ohio (50,000–80,000), Pennsylvania (up to 15,000), Illinois (up to 12,000), Minnesota (up to 7,000), Wisconsin (up to 6,500) and California (up to 20,000).

Generalni konzulat Republike Slovenije v Clevelandu, Slovenska skupnost v ZDA.

<https://www.gov.si/predstavnistva/generalni-konzulat-cleveland/slovenska-skupnost-v-zda>

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# TECHNICAL MUSEUM OF SLOVENIA



Technical Museum of Slovenia. Photo: Jure Korber.

The Technical Museum of Slovenia is the central national museum dedicated to the preservation of technical heritage in relation to the development of craft and industry. Heritage of particular interest includes products of the local know-how and those that made a difference in everyday lives of the Slovenian people. The museum's permanent collections and temporary exhibitions show and promote the achievements in various fields of science and engineering.

## FROM ROMAN STONEWORK TO A 21ST CENTURY MUSEUM

Known in Latin as *Vallis locosa* (Happy Valley), the walls of the former Bistra monastery today house one of the largest museums in Slovenia. Walking its rooms and enjoying captivating views it is perfectly clear why the Carthusian<sup>1</sup> monks,

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<sup>1</sup> A Catholic monastic order founded by St. Bruno of Cologne in 1084 in the valley of Chartreuse (France). The Carthusians combine the life of hermits with a common life within a cloister. Their life is solitary and devoted to contemplation and prayer. Today, Pleterje is the only Carthusian monastery in Slovenia.

members of one of the strictest Catholic monastic orders, made it their home in the Middle Ages.

The earliest evidence of Bistra goes back to the Roman period; Roman stonework and two tombstones which probably originate from the graves in Nauportus.<sup>2</sup> Taking its name from the karstic springs of the Bistra river, the settlement reached its peak in the time of the Carthusian monastery. The charterhouse was founded between 1255 and 1260 by the Carinthian Duke<sup>3</sup>, Bernard Spanheim and his son Ulrich III who secured its existence through a charter.



Copperplate of the Bistra monastery, J. V. Valvasor, *A Contemporary Topography of the Duchy of Carniola*, 1679.

In the late 17th century, Janez Vajkard Valvasor<sup>4</sup> wrote in his magnum opus *The Glory of the Duchy of Carniola*: “The monks seem to have chosen this valley for their house, for a silent home in solitude where they could, alone and undisturbed, without any company, enjoy comforting views of this enchanting vale so distant from the hustle and buzzle of other populated areas; there are no villages in the vicinity.”

In its six hundred years, the Bistra monastery experienced its fair share of ups and downs and was rebuilt on several occasions. It was nearly destroyed by two large fires in the 14th and fortified in the defense against Turkish incursions in the 16th centuries. In Baroque, the monastery saw intensive reconstructions and additions. Built in this period, St. Joseph Chapel is lavishly decorated with stucco work and late 18th century frescoes.



Fresco decoration was executed by the Ljubljana painter Anton Cebej. Photo: Jaka Blasutto.

As a man of the Enlightenment, Emperor Joseph II<sup>5</sup> banned several contemplative monastic orders in 1782, including the Carthusians. Monks left the monastery, the monastic church and monk cells along the great cloister were demolished. Besides St. Joseph Chapel, a little Gothic cloister with elaborate stonework and impressive Baroque buildings with arcades survived of the original structure.

<sup>2</sup> Originally a settlement of the Celtic tribe of the Taurisci, Nauportus (modern Vrhnika, four kilometers from Bistra) was controlled by the Romans from the late 2nd or the early 1st century BC. It was located on the east-west transit route between Italy and the Middle Danube area.

<sup>3</sup> The Duchy of Carinthia covered the territory of southern Austria and parts of northern Slovenia. It was a State of the Holy Roman Empire until its dissolution in 1806, though from 1335 it was ruled within the Austrian dominions of the Habsburg dynasty. Carinthia remained a crown land of Austria-Hungary until 1918.

<sup>4</sup> Born in the town of Ljubljana, Valvasor, in German Johann Weikhard Freiherr von Valvasor (1641–1693), was a natural historian, a polymath and a pioneer of study of karst phenomena. In 1687, his extensive treatise on the intermittent Lake Cerknica won him a Fellowship of the London Royal Society.

<sup>5</sup> Joseph II (1741–1790) was Holy Roman Emperor from 1765 and sole ruler of the Habsburg Monarchy from 1780 until his death. The eldest son of Empress Maria Theresa and her husband, Emperor Francis I, Joseph was one of the three great Enlightenment monarchs. His reforms were a conscious attempt to reorder the rule of his lands on the idea of the unitary state, with a centralized government, rational and mostly secular society, with greater degrees of equality and freedom.



Of eleven illuminated manuscripts preserved from the time of the charterhouse, most notable is a transcription of St. Augustine's *The City of God* from 1347.



St. Augustine's *De Civitate Dei*, National and University Library, The Manuscripts, Ms. 2.

In the 19th century, the merchant and industrialist Franc Galle<sup>6</sup> bought the Bistra estate and gave it the appearance of a fine manor it has kept to this day. The former monastery cemetery was turned into a park and the house decorated with stylish furniture, paintings and hunting trophies, giving it a sophisticated flair.

After being nationalized at the end of WWII, the Bistra estate was passed over to the national Forestry Institute which prompted the foundation of the Forestry, Woodworking and Hunting Museum. The Technical Museum of Slovenia was established in 1951, and within two years, the first forestry, woodworking and hunting collections were opened to the public. Today, over 6,000 m<sup>2</sup> are dedicated to the display of permanent collections on agriculture, road vehicles, water-powered machinery, forestry, woodworking, wildlife & hunting, fishing, textiles, printing and electrical engineering.



A flair of nobility. Photo Jaka Blasutto.

## THE AMERICANS IN SLOVENIA AND VICE VERSA

At this point, we will zoom in on some objects from our collections that were either used by or influenced everyday life of Slovenians and are directly or indirectly related to the United States.

Forestry and woodworking collections have the longest standing in our museum. Covering three fifth of its territory, Slovenia can easily be styled the land of forests. In terms of forest density, it is only second to Finland and Sweden in Europe. Two of the major topics addressed by the permanent exhibition are the significance of forest as a source of energy and its social benefits, especially in modern times.

Sawmilling was an important economic activity already back in the times of the charterhouse which traded in timber. Today, several karst springs of the Bistra river provide perfect natural conditions and scenery for water-powered machinery, such as the veneer and Venetian sawmill.

<sup>6</sup> Galle was a reputable Ljubljana bourgeois family involved in different business activities. In 1911, they built a hydropower plant on their estate in Bistra. Renovated and modernized to maintain its operation, this over 100 years old power plant still generates electrical energy. Enough to fully meet the museum's needs.



Transferred to Bistra in 1980, the original sawmill from Podrečje supplied veneer to Ljubljana craftsmen from 1824 to 1952. Photo: Dragan Arrigler.

Fast forward. Talking about post-WWII industrial design and timber, we cannot but brag that the iconic *Rex* foldable armchair designed by the architect Niko Kralj in 1952, is included in the permanent collection of the Museum of Modern Art (MoMA) in New York City.



With over two million chairs produced, Niko Kralj's design has served - and still does - many generations. Photo: Jaka Blasutto.

The Slovenian Hunting Museum, which is a part of the Technical Museum of Slovenia, preserves several hundred exhibits, from taxidermic specimens, trophies, hunting weapons and accessories, to medals and other objects which testify to the hunting tradition in our land. Other than illustrating the history of hunting, the museum aims to raise public awareness of nature and environmental protection, with a special focus on wildlife ecology.



Diorama with a focus on a group of chamois. Photo: Blaž Zupančič.



A hunting rifle manufactured by Iver Johnson Arms, Arkansas, USA. Photo: Jaka Blasutto.

Agriculture was one of the principal and basic economic activities of most of the Slovenian population as late as the mid-20th century. Coming from various regions, the artefacts and materials collected demonstrate the development of crop production, grassland management, animal husbandry, fruit growing, viticulture and winemaking. The exhibits from earlier period mainly include hand tools, small devices, and equipment. Mechanization of agriculture at the turn of the 19th and 20th centuries provided farmers machinery and equipment which substantially facilitated their work.

Slovenians seem to be very fond of technology. According to some estimates, we are the nation with the largest number of tractors per capita in the world! In spite that the country covers a little over 20,000 km<sup>2</sup> and has relatively small arable areas.



Believe it or not – every twentieth Slovenian has a tractor. Photo: Blaž Zupančič.



Old carding machine used to separate threads of material before spinning. Photo: Neža Renko.



Coming from the U.S., this engine-powered push mower was dubbed "the American". It was manufactured by Dille and McGuire in 1953. Photo: Blaž Zupančič.



Commercial Singer sewing machines used in garment manufacturing trade. Photo: Jaka Blasutto.

*Textiles in Times Past and Today* is a permanent exhibition showing the evolution of textile technology in Slovenia from crafts to textile industry, which was one of the most important industries in the country. The first textile plants – spinning and weaving mills – emerged in the first half of the 19th century. From these and other textile works, the museum holds spinning, weaving, knitting and other machines.

A major milestone in the development of ready-to-wear clothing industry was the invention of a sewing machine which soon found its way to both industry and practically every Slovenian household.

Humanism and the Protestant Reformation in the 16th century were central for the Slovenian national identity. We got first printed book in Slovenian language, Primož Trubar's *Catechismus*, together with his *Abecedarium* (1550), and the first Slovenian translation of the Bible by Jurij Dalmatin (1584). The exhibition *The Written Word: History of Printing in Slovenia* covers five centuries of the printed word and printing techniques from Trubar to the early 20th century. It addresses the origins of the black art<sup>7</sup> in the world and locally, Gutenberg, the invention of movable type and the first printed book in Europe.

<sup>7</sup> Letterpress printing is sometimes affectionately referred to as "the black art", due to inevitability of ink on fingers.

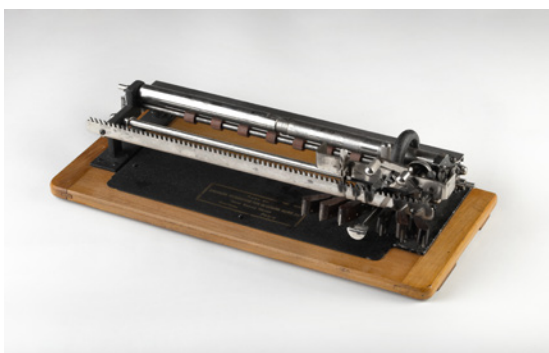




This is what printing looked like in the olden days. Photo: Blaž Zupančič.



Tito's Lincoln Continental. Photo: Aleksander Šenekar.



Jauny Braille typewriter allows blind and visually impaired to write in Braille alphabet, ca. 1930. Photo: Nada Žgank, Domen Pal.



Besides Austro-Daimler and Wanderer (produced before and few years after WWI), the car collection includes a 1930's Chrysler limousine, which was one of popular American car brands in our country. Photo: Dragan Arrigler.

The first car came to the museum in 1953, and over the next seventy years it multiplied into extensive collections of all sorts of road vehicles. The exhibitions *Our Beloved Car*<sup>8</sup> and *Motorcycles from Koper* sum up the first century of motoring in Slovenia and the history of the only Slovenian motorcycle manufacturer, Koper-based Tomos factory.

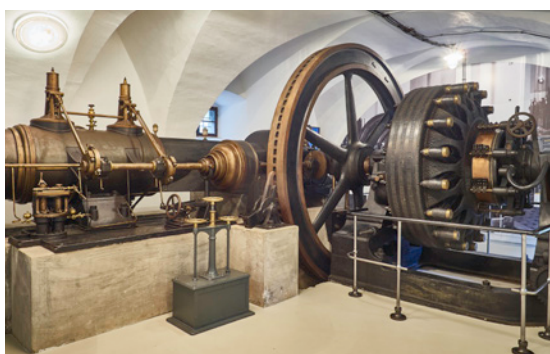
Significant both as technical heritage and because of its historical value, the collection of limousines that were in possession of Yugoslav President Tito has a special place in our museum. It is complemented with the first armored state car purchased in the independent Slovenia.

Lincoln Continental — a four-door cabriolet with the 8V engine, fitted with air-conditioning, power seats and a lot of other amenities, was donated to Tito by the staff of the Zagreb Fair in September 1965. Tito used it on the Brioni Islands until 1979, driving around his many guests from all walks of life; among others a famous on-and-off couple Richard Burton and Elizabeth Taylor. Burton visited Yugoslavia in the preparation for the role of Marshal Tito in a 1973 partisan film *The Battle of Sutjeska*.<sup>9</sup>

<sup>8</sup> Other than a Baron and the owner of the first car in Carniola (Benz Velo Comfortable, 1898), Anton Codelli (1875–1954) was a prolific inventor. His first patented invention was an ignition system for automobile engines (the patent was also registered in the USA), and his most acclaimed a device for mechanical transmission of an image at a distance. In Togo, Africa, he was involved in the construction of a radiotelegraph station “guilty” of the first radio transmission between Africa and Europe in late 1913 – a remarkable achievement at that time.

<sup>9</sup> From Burton's diary entries recording a trip with (at the time) his wife E. Taylor to visit Tito in preparation of the film: August 7, 1971. He met Churchill, who

The permanent exhibition *Caution, Electricity!* is about the electrification of Slovenia. The oldest exhibits are a distribution panel and generator from a small hydro-power plant in Jelendol (at the time Puterhof) near Tržič. It was built in 1895 by Baron Julius Born, the owner of nearly a third of all woodlands around Tržič, as well as the Puterhof manor. Put on display are also a steam engine and generator from the old municipal power plant in Ljubljana. Starting its operation on 1st January 1898, it was, at the time, the largest public power plant in what is now Slovenia.



Good old two-phase steam engine and generator. Photo: Dragan Arrigler.

Besides permanent and temporal exhibitions, the museum organizes all sorts of events and programs for young and old(er) visitors: from educational programs for preschool, elementary and secondary school children, workshops and guided tours to demonstrations. Of the latter, Nikola Tesla experiments are one of the most popular. It is not common knowledge that this brilliant – and eccentric – inventor spent several months in Maribor in 1878/79 where he had a job with an engineering company.



Kids learning about space travel within the temporary exhibition on the 50th anniversary of the landing of a man on the Moon (2020). Photo: Ursula Osojnik.



The experiments are pretty much the same as those performed by Tesla himself over a hundred years ago. Photo: Ursula Osojnik.

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was in the vicinity on Onassis' yacht. Winston C. accepted a very small whiskey. Tito had his usual large one. "Why so small a portion?" asked Tito. "You taught me to drink large ones." "That was when we both had power," said Winston C. "Now I have none and you still have yours."

## MUSEUM OF POST AND TELECOMMUNICATIONS

An off-site unit of the Technical Museum of Slovenia, the Museum of Post and Telecommunications is housed in the Polhov Gradec Mansion.<sup>10</sup> It gives an overview of the history of post from prehistory to modern days,<sup>11</sup> while the permanent exhibition *(Tele)communications in the Past, at Present, and in the Future!* illustrates the development of telecommunications from Morse telegraph to the first mobile phones.



The mansion has a beautiful park with a rose garden. Photo: Dragan Arrigler.



Strowger automatic telephone exchange. Photo: Blaž Zupančič.



Designed in 1978 by Davorin Savnik, the ETA 80 telephone manufactured by Iskra also makes part of the MoMA permanent collection on industrial design. Photo: Mare Cotič-Trojer.

Our visitors can test some exhibits themselves, for instance the manual and automatic telephone exchanges. Installed in Ljubljana in 1927, Strowger was the first automatic telephone exchange in the Kingdom of Serbs, Croats and Slovenes.

This is just a glimpse of our museum. If – no, it doesn't sound right... When you come to Slovenia, don't be a stranger. Drop by, there is a whole lot more to be discovered...

<sup>10</sup> In the first half of the 19th century, Count Richard Ursini von Blagay became the owner of the Polhov Gradec estate and mansion. Count Blagay was a botany enthusiast, and in 1837 he was brought an unknown flowering plant by one of the locals. He immediately knew that something important was found, assuming it was probably a daphne. He was right, his daphne was really a new species, named in his honor *Daphne blagayana*.

<sup>11</sup> Lovrenc Košir (1804–1879) was a civil servant with the Austro-Hungarian Royal Postal Accountancy Office. In 1835, he proposed improvements to the postal service and the introduction of an adhesive tax-paid postmark – a postage stamp. His idea was ahead of its time and rejected by the authorities. His latter attempts to be acknowledged as the inventor of postal stamps failed because his original proposal documents were lost.



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MINISTRY OF CULTURE**



**REPUBLIC OF SLOVENIA  
CONSULATE GENERAL CLEVELAND**



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