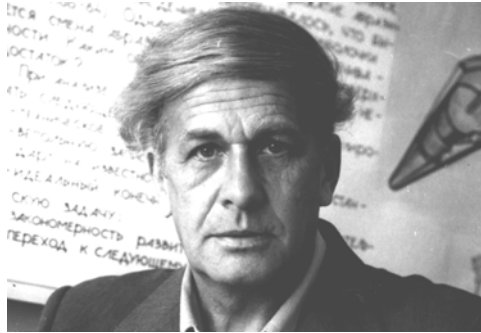


GENRIKH ALTSHULLER – THE CREATOR OF TRIZ



Genrikh Saulovich Altshuller was born on October 15, 1926 in Tashkent, Uzbekistan (formerly the USSR) to a family of journalists. A few years later, the family moved to Baku, Azerbaijan (USSR).

Altshuller was awarded his first author's certificate (the Soviet-era equivalent of a patent) for a diving gear when he was in the tenth grade. While in high school, he also built and tested a boat with a jet engine that used carbide as fuel.

After graduating high school with honors, Altshuller was admitted to the Azerbaijan Industrial Institute. In 1944, with World War II still raging, he enlisted in the army. Though he trained as a fighter pilot, the war was over before he had a chance to participate in combat. In 1946, Altshuller was assigned to the Commission on Innovation of the Caspian Navy Flotilla¹, where he continued to invent in various fields of technology. During this time, one of his inventions was a solution to an unusual challenge: How to neutralize, without using any lethal means, a large contingent of enemy troops? Altshuller's answer: Use an extremely malodorous compound that can be easily concocted from ingredients found in a drug store. Decades later, such an “odor weapon” was reinvented (Troshinsky, 1999).

Altshuller was 20 when he began the research that would later become TRIZ. He decided to develop a method for systematic invention that could transform engineering creativity from magic, attainable by few, into a logical discipline available to many more. He conjectured that the key secrets of inventiveness should not be sought inside the inventors' minds, but rather in the logic of the inventions themselves. He realized that multiple industries and technologies used the same inventive principles. Altshuller reasoned that if it was possible to extract these principles, then the pace of innovation would greatly accelerate. In search of such principles, Altshuller began studying patents and the histories of inventions. Through 1946-1948, he made these key discoveries: 1) a breakthrough invention is the result of overcoming a system conflict, and 2) technological systems evolve toward increasing ideality. He also proposed the initial

¹ The flotilla was headquartered in the city of Baku.

formulations of the law of transition to a higher-level system and the law of rhythms harmonization.

In 1948, Altshuller and his schoolmate and associate, Rafail Shapiro, wrote a letter to the Soviet dictator Josef Stalin. The letter stated that the country was in ruins after the war, and that the resources needed for its recovery were scarce. To help the nation, the authors suggested using TRIZ. The reply came in 1949: Altshuller and Shapiro were arrested, interrogated and sentenced to 25 years in the notorious Vorkuta labor camp, above the Arctic Circle.

In the camp's coalmine, Altshuller toiled along with many representatives of the academic and industrial elite, who were slowly dying in the camp's brutal conditions. He realized that in order to survive, not only physically, but also spiritually and mentally, he had to continue his education and research. Altshuller opened a "One-Student University:" Every night, in the barracks, former university professors taught him physics, mathematics, art history, literature and foreign languages. These lessons taught Altshuller a great deal, and allowed the academics to endure far longer than they would have without him.

In 1953, Stalin died. In 1955, Althsuller returned to Baku where he resided until 1990. A year later, the first article on TRIZ was published (Althsuller and Shapiro, 1956).

Since it was virtually impossible for a recent political prisoner to find a permanent job, Altshuller decided to make a living by writing science fiction. His first story, *Icarus and Dedalus*, was published in 1957. Writing under the pen-name Altov, he quickly became a popular author; his sci-fi stories and novels were translated into many languages (*see, e.g., Altov and Zhuravleva*², *Ballad of the Stars*, New York, McMillan, 1982). The typical protagonist in the stories is a creator of some groundbreaking invention, living in our time. The author closely examines the philosophical and societal implications of the protagonist's inventions. Altshuller's stories are packed full of brilliant sci-fi ideas, some of them rather realistic. For example, in his *Donkey and Axiom*, published in 1965, he suggested that a light beam generated by an Earth-bound laser might propel future rockets. This beam would not only supply energy to the spacecraft, but would also carry information from the Earth to the astronauts. The concept of laser-propelled spacecraft has been recently discussed in scientific literature (*see, e.g., Landis, 1989*), and a prototype of such a vehicle is being developed by Lighcraft Technologies, Inc.

In parallel with the development of TRIZ, in 1964, Altshuller began the research into the mechanisms of generating new sci-fi ideas. This project culminated in the mid-70's with *The Register of Sci-Fi Ideas and Situations*³, which contains about 10,000 ideas catalogued into classes, sub-classes, groups, sub-groups, etc. Analysis of this science fiction's "patent database" helped Altshuller develop many techniques used in his courses on creative imagination development.

² Valentina Zhuravleva (1933–2004), Altshuller's wife, co-author, and long-time associate, was also a prominent sci-fi author.

³ This work is available in Russian only, at <http://www.altshuller.ru/rtv/sf-register.asp>.

Altshuller always worked from home. Nevertheless, from 1959 through 1985, he crisscrossed the Soviet Union holding dozens of workshops and seminars on TRIZ. The duration of many of these workshops was two to three weeks. In 1971, he founded the Public Institute for Inventive Creativity, which became the first center of TRIZ learning in the world. He also helped to organize local TRIZ schools all over the former USSR. By the end of the 1980's, over 500 schools existed.

From 1974 through 1986, Altshuller published dozens of tutorials on TRIZ in a national child's weekly magazine. The tutorials contained problems presented in an easy to follow, entertaining way. The readers – mostly middle- and high-school students – sent him letters with solutions to the problems. Through the analysis of about half a million of these letters, Altshuller wrote a bestselling book *And Suddenly the Inventor Appeared* in 1984.

Altshuller did not see TRIZ only as a system of powerful concept generation tools. For him, it was a means of developing skills for what he called *strong thinking* (this is a literal translation from Russian; another possible version would be *analytical independent thinking*).

Altshuller held the view that the most significant revolutions are caused by new powerful ideas. He also maintained that the well-being (both ethical and economical) of a society depends largely on the proportion of creative individuals in that society. A creative individual, according to Altshuller, pursues a major noble goal (some examples: Allen Bombard, Albert Schweitzer and Albert Einstein). To achieve this goal, the creative individual must be able to think innovatively, i.e., analytically, holistically and independently.

Altshuller also believed that many acute problems that humanity faces, and will inevitably confront in the future, might be eliminated (or prevented) but for our inability to think logically and independently. Man's only means of understanding and changing reality is reason. We cannot survive unless we fully develop and employ our intellectual power to achieve ethical and material goals that can assure the continual evolution of the human race. Consequently, Altshuller considered TRIZ a prototype for the future universal method of developing *strong thinking*.

To help raise creative individuals, in 1984 Altshuller and his student and associate, Igor Vertkin, started a new project – they analyzed hundreds of the biographies of innovators in science, technology, art, religion, politics, etc. The result was the monumental *Life Strategy of a Creative Person* (Altshuller and Vertkin, 1994).

In 1989, Altshuller became the President of the International TRIZ Association, founded by his former students. In 1990, he and his family moved to Petrozavodsk, Russia, where he passed away on September 24, 1998, due to complications from Parkinson's disease.

Altshuller's literary heritage is vast: 20 books, about 400 papers, thousands of letters. His other legacy is not easy to quantify, but might be even more significant: thousands of

people all over the world who, for first time in their lives, have (and will have) experienced one of the most potent human emotions – the joy of creativity.