

## Remembering Explorer 1 —by Joseph C. Loon



Fifty years ago, on January 31, 1958, the first American satellite, Explorer 1, launched by a Jupiter-C rocket, achieved a successful orbit around the Earth. A few months earlier—on October 4, 1957—the Russians had launched their Sputnik 1, and the space race was on. Sputnik was a 23 inch sphere while Explorer 1 looked like an 80-inch-long cigar.

Our world had changed forever. The space race was not only a matter of pride for both countries; it brought forth many military and security issues. The winner would claim the prize of a super-power—in scientific achievement and in political status.

From today's perspective, the U.S. won this race with spectacular results. Scientific discoveries started immediately after the launch of Explorer 1 and continue to this day. Explorer 1 confirmed the existence of what came to be called the Van Allen Radiation Belts. History has a strange way of unfolding—the German scientist, Werner Von Braun, whose V-2 rockets caused destruction to London during World War II, surrendered to American forces, and his work in the USA made possible the launch of Explorer 1.

In addition to the Moon landing, as well as satellites orbiting some planets of our solar system, and the spectacular images sent to Earth from the universe, there are many spin-offs of this race into space. Who would have guessed that blood pressure recorders, a medical alloy called nitinol used in dental braces, heart pacemakers, and implantable insulin pumps, to name just a few, may not have been discovered if Explorer 1 had not made its maiden voyage half-a-century ago.

Space exploration has led to many unintentional benefits to mankind. It is estimated that there are more than 30,000 of these so called "secondary applications" in our homes, offices, and hospitals. Fifty years ago we did not have personal computers, cell phones, GPS units in our vehicles, cordless tools, satellite dishes, wireless communications, and many other technological accoutrements that we live with today. The space race was the impetus that drove the development of today's technology, and the launching of satellites was the fire that lit this impetus.

At the time of the launching of Sputnik and Explorer 1, I was a member of the Cape Town Moonwatch team in South Africa. Moonwatch teams were set up all over the world to visually track satellites. At one time there were more than 230 Moonwatch teams with more than 5,000 volunteers. On the grounds of the Royal Observatory in Cape Town, special telescopes were set up on pillars so as to cover a meridian, that is, a north-south imaginary line in the sky. The editors of *Sky and Telescope* described this as "an 'optical fence' along the celestial meridian, with up to a dozen observers using low-powered, wide-field telescopes." Fifty years ago, satellite tracking was in its infancy, and most observations to satellites were visual. This "optical fence" ensured that any object crossing this meridian in Cape Town could be observed. The telescopes were calibrated so that we would know the exact time and

altitude of the satellite. This information was needed to define its orbit accurately. The grounds of the Royal Observatory were well known to me at that time. I went there for the monthly meetings of The Astronomical Society of South Africa and I belonged to a group hand-grinding six-inch lenses for telescopes.



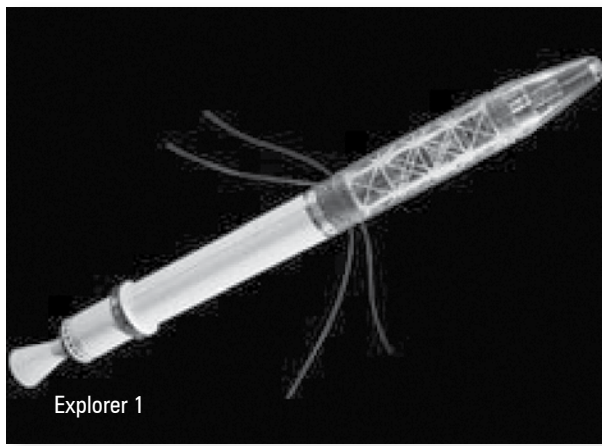
I was fortunate enough to observe Explorer 1 in the telescope that I manned. The Johannesburg newspaper *The Star*, in its Saturday 8<sup>th</sup> February 1958 edition, reported "There was a dramatic moment in the grounds of the Royal Observatory when the quiet of the early morning was broken by Mr. Loon shouting: "I've got it." He followed this up with the prearranged shout of "pip." Immediately five stop watches clicked as one. . . .the reading given by the stop watches was '4 hr 54 min. 34 sec., South African Standard time on February 8, 1958. The other readings were Altitude 72° 20' at 0.4 degrees east of north." The local newspapers thought that I was the first person in the world to see the satellite, and I had my 15 minutes of fame! But it later turned out that I was, indeed, the first person outside the USA to see the satellite at that time.

In October 1957, I took observations of Sputnik with my theodolite set up in a park in a suburb of Cape Town but did not submit them to *Cosmos* in Moscow because relations with Russia at that time were not too good!

The Cape Town Moonwatch team was led by William (Bill) P. Hirst, who calculated Explorer's orbit so that the Moonwatch team would be ready for an observation. Years later, Bill was in charge of all the Moonwatch teams around the world, and he taught Celestial Mechanics at the University of Cape Town. In 1981, he was given the honor of having a minor planet named after him.

The chief assistant at the Cape Observatory was Dr. David S. Evans, who also assisted the Moonwatch team. Dr. Evans later became professor of astronomy at the University of Texas. In addition to his brilliant career as an astronomer, he wrote the book "*Teach Yourself Astronomy*," an easy-to-read text for non-professionals. Many of the volunteers connected with the

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Explorer 1



Launching of Explorer 1

Moonwatch teams went into areas related to astronomy and surveying.

Those exciting times were not without some amusing incidents. We would go out for practice session a few hours before dawn. (Satellites were seen by the reflected light of the sun a few hours after sunset or a few hours before dawn). My neighbor in the apartment complex where I lived (a single mother with a teenage daughter) was having trouble with her daughter who kept admitting her boy-friend into her room and locking the door so that the mother could not enter.



A model of Explorer 1, held by JPL's Director William Pickering, scientist James Van Allen and rocket pioneer Wernher von Braun (from left to right). The team was gathered at a news conference at the National Academy of Sciences in Washington, D.C., to announce the satellite's successful launch. America's first satellite, Explorer 1 had launched a few hours before, on Jan. 31, 1958, at 10:48 p.m. EST.

Early one morning at about 3 a.m. I was standing outside the apartment complex waiting for a friend to pick me up to go to the Royal Observatory for Moonwatch duties. Suddenly, someone came running down the steps with his shoes in his hands. A few minutes later, a police car pulls up in front of me; two policemen jump out and grab my arms. "If you are looking for someone, he just ran down the street," I said. They laughed and manhandled me upstairs, where the mother said that she did not think that I was her daughter's boyfriend! But, she wasn't sure!!

The previous week, I was out in the field fixing control for photogrammetric mapping for the government mapping office. The work took me up to the very steep cliffs near Cape Point. It took me longer that I had expected and I could not return by the time the sun set. So I had to sleep on the cliff side. In the morning, when I walked over the mountain to my car, I met the search parties and of course, my wife was worried too. The neighbor heard this story and may have thought that I was making it up to cover up some tryst!. But when I explained to the police what I was doing outside the building at three in the morning, being cautious, they decide to take me to the Royal Observatory to check out my story. It caused a mild sensation to arrive at the Moonwatch team with a police escort!

Fast-forward to space exploration. The exploration of space was achieved by the hard work and dedication of many engineers, scientists, and astronauts. Some of the latter lost their lives in this endeavor and we need to pay homage to all who worked on this massive project.

The Jet Propulsion Laboratory (JPL) California Institute of Technology has taken the lead in commemorating the launching of Explorer 1. They had a float marking this occasion in the last Rose Bowl float procession. More information on the history, images videos & audio, and downloads relating to Explorer 1 are available at <http://www.jpl.gov/explorer>.

I will not be here for the 100<sup>th</sup> anniversary of the launching of Explorer 1 but I hope that many readers will. Anniversaries remind us of a great many people and events that have affected our lives and we should not hesitate to celebrate, for in a way we are celebrating our future.

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