



Charles H. Townes (right, with JPL Director W. H. Pickering), at JPL for a NASA meeting on manned space flight, the day he got the news of his Nobel award.

NOBEL PRIZEWINNER

Charles H. Townes, provost of the Massachusetts Institute of Technology, who received his PhD from Caltech in 1939, is co-winner of the 1964 Nobel Prize in Physics. He will receive half of the \$53,123 award, which he shares with two Russian scientists, Nikolai Basov and Aleksandr Prochorov, for development of the maser-laser principle of high intensity radio and light rays.

Dr. Townes and his colleagues developed the first maser (an acronym for microwave amplification by stimulated emission of radiation) in 1954, when he was professor of physics at Columbia University in New York. In the maser, radio microwaves are used to induce molecules and atoms to release stored energy, resulting in an amplified electronic wave — a concentrated radio beam with such power that it has become of major use to communications, astronomy, military science, and medicine.

Townes used his first maser to control an atomic clock of such extraordinary accuracy that it would vary no more than one second in 300 years.

In 1958 Townes proposed the laser (light amplification by stimulated emission of radiation), a single color light beam whose intensity is so great and whose spread is so slight that it has been used to illuminate a small patch of the moon. Its wavelength is so uniform and coherent that it can be frequency- or phase-modulated. The laser is already being used in a variety of ways, in surgery, biological research, distance measurements, and signaling research. Future maser-laser techniques are expected to revolutionize communications by enabling transmission of as many as 10 million simultaneous television programs with a single beam.

Drs. Prochorov and Basov, who are both on the

staff of the Lebedev Physics Institute in Moscow, conceived the idea of masers shortly after Dr. Townes began his work. Both are radio physicists. Townes and the two Russians are acquainted, having met at international conferences.

When Townes was at Caltech, he studied under Dr. William Smythe, professor of physics emeritus, and he is the fifth of Dr. Smythe's students to win the Nobel Prize in Physics. The others were Carl Anderson in 1936, Edwin McMillan in 1951, William Shockley in 1956, and Donald Glaser in 1960.

Townes received his BS in physics, summa cum laude, at Furman University in Greenville, S. C., at the same time as he received a BA in modern languages. He still retains a strong interest in languages, and has a working competence in French, German, Spanish, Greek, Russian, and Latin.

He got his MS from Duke University in 1937. After receiving his PhD from Caltech in 1939, Townes worked on the staff of the Bell Telephone Laboratories, where he developed wartime radar bombing systems and navigation devices. He joined the faculty of Columbia University in 1947, and was chairman of the physics department from 1952 to 1955. He was a Guggenheim Fellow in 1955-56 and a Fulbright lecturer, first at the University of Paris and then at the University of Tokyo. From 1958 to 1961 he served on the Air Force Scientific Advisory Board, and in 1959 was named a consultant to President Eisenhower's Scientific Advisory Committee. Prior to his appointment at MIT, he was on leave of absence from Columbia, serving as director of research for the Institute for Defense Analyses in Washington, D.C. He has been provost and professor of physics at MIT since 1961.