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Townes offers insights into his career, experiences

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APPLICATIONS SET ANOTHER RECORD

For the fourth time in six years, Furman received a record number of applications from prospective students.

As of late March, the university had received 3,589 applications (3,504 freshmen and 85 transfers) for the 2000-2001 academic year. Furman expects to enroll approximately 690 freshmen when the new year begins in September.

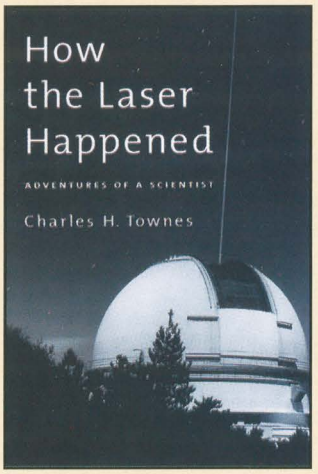
According to Woody O'Cain, director of admissions, Furman could receive as many as 3,700 total applications before school starts in the fall. Last year's applicant pool totaled 3,340.

Furman set its previous record of 3,410 in 1998. Undergraduate enrollment is approximately 2,600 students.

O'Cain said that this year's applicant pool represents 48 states and 29 countries, with nearly 70 percent of the applicants ranking in the top 10 percent of their high school classes. Applications from minority students are up 10 percent.

According to O'Cain, the increase in applications was fueled by new facilities and programs on campus, by a stronger recruiting effort in such areas as Texas, Virginia and Tennessee, and by an aggressive marketing strategy that is drawing more prospective students to the campus for visits.

Townes offers insights into his career, experiences



Charles Townes' *How the Laser Happened: Adventures of a Scientist* (Oxford Press) is a book about science, sociology, and an introspective and gifted scientist who shares his thoughts about one of the great discoveries of our age — the laser.

Townes, a 1935 Furman graduate, traces his journey from the small-town rural life of Greenville to the University of California, where today he is University Professor of Physics Emeritus. He points to the influence of his parents, who encouraged an interest in nature and felt that Furman "was a good place to be."

After Furman, Townes attended graduate school at Duke University, then at Cal Tech. He then spent eight years (1939-47) with Bell Telephone Laboratories working on the development of radar, which proved to be excellent preparation for his future work.

The most interesting part of Townes' story is the recounting of his lab experiences, and his interaction with others, which led him to the maser and ultimately to the laser. While describing his idea for the maser, he tells of a visit to Washington, D.C., to form a committee for the Navy, which wanted Townes and other scientists to study the problem of producing electromagnetic waves at the millimeter wavelength.

Townes awoke early on the morning the committee was to meet — April 26, 1951 — and went out to a deserted bench among the azaleas near Franklin Park. There he puzzled over the committee's lack of ideas. As he pondered the problems of making tiny electron resonator tubes, he suddenly thought that perhaps there was some physical mechanism involving solids or molecules that could be used to produce wavelengths in the millimeter range.

Townes was thinking of the second law of thermodynamics — and its implications. He writes that "the key revelation came in a rush: Now, wait a minute! The second law of thermodynamics assumes thermal equilibrium; but that doesn't really have to apply! There is a way to twist nature a bit. . . . If one were, somehow, to have a collection entirely of excited molecules, then, in principle, there would be no limit to the amount of energy obtainable. The greater the density of excited atoms or molecules, and the longer the distance through them that the radiation wave goes, the more photons it would pick up and the stronger it would get."

Townes wrote a preliminary analysis of his idea on the back of an envelope and went off to the meeting. Later, at his laboratory at Columbia University, he and his co-workers put together the first maser, which generates copious amounts of power through microwave amplification by stimulated emission of radiation.

The book reviews Townes' efforts which led to the invention of the maser and later to the development of the laser. And he recounts, in candid fashion, the legal controversy that arose after the development of the laser in a chapter titled "The Patent Game."

In his concluding chapter, he quotes biochemist Albert Szent-Gyorgi: "Discovery is seeing what everybody else has seen, and thinking what nobody else has thought." Townes goes on to say, "The laser discovery seems to fit this image: it is built upon ideas that were long known, at least to some. Yet the ideas had to be assembled in a novel way and the value of doing that had to be recognized."

This book captures the reader's interest from start to finish. It seems almost understated — modest and not given to grand claims, much like the author — but the import of what Townes achieved comes across clearly. The laser: so practical and useful a device, yet it captures the imagination in terms of potential and is almost science fiction-like in nature.

— William H. Brantley
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