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If there is ever a contest for the world's brightest "dizzy blonde," a physicist who works for the Massachusetts Institute of Technology's Instrumentation Laboratory should win the title.

Agneta Mueller, well-educated, intelligent and pretty, doesn't mind being called dizzy, because several times a week she actually does become dizzy while performing important scientific work.

The daughter of a professor of physics at M.I.T., Miss Mueller is a staff member at the Instrumentation Laboratory's Special Test Facility at Hanscom Field. The 28-year graduate of Tufts (Class of '52) has many duties, but the most unusual -- and one of the most frequent -- is making optical observations from a tiny platform above the middle of a whirling, 18-ton merry-go-round technically known as a centrifuge.

The centrifuge is an expensive, specially-housed testing device with a thirty-two foot radius steel arm. Operated by remote control, the heavy arm is moved by a 450-horsepower hydraulic drive and can be rotated as fast as 200 miles an hour. The M.I.T. centrifuge is the only one of such size now used for inertial guidance research in the United States, and is considered to be the most precise centrifuge in the world.

Miss Mueller's job is to look through a telescope from the very center of the centrifuge and measure how much the arm is distorted by the enormous centrifugal force. Using a system of lights and angled mirrors, she watches a tiny circle of light through her telescope, and by observing this can determine the precise up or

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down movements of the arm.

Miss Mueller does this job frequently, because one of the major items of work at the Special Test Facility is testing gyroscopes. These special gyroscopes -- the most precise ever made -- are developed at the Instrumentation Laboratory. They are an important component of the new method of navigation by inertial guidance now being used in missiles and submarines. Complete systems, containing three gyroscopes, are installed in a spherical metal case at one end of the centrifuge and ride the rotating arm at various speeds during the testing process.

Much of the work is classified, and Miss Mueller can't be too specific about details. However, she can say that no other woman in this country, and probably no other woman in the world, has a similar task.

"I measure an angle by using what is known as a Filar Micro-meter in place of the regular eyepiece on the telescope," the physicist explained. "I've done this so often that people in the lab now refer to it 'Aggie's Angle.'"

Conducting a test on the big centrifuge is a detailed and difficult task, according to Miss Mueller. "It's a rather dirty job," she said, "because I have to crawl around and under objects to set up my equipment. I wear blue jeans or khaki trousers, and usually get my face smudged with grease.

"After getting everything ready," she continued, "I'm left alone in my little cage above the centrifuge. I use a microphone to tell the control room operator to start the centrifuge. After it starts whirling, I'm completely at the mercy of the operator, because I can't leave my post, and no one can enter the room --

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it would be sure death to be struck by the arm."

Alone in her isolated, stationary cage, and concentrating on taking readings through the telescope, Miss Mueller usually spends from 30 to 45 minutes at her work. "I found that the noise, the vibration, and the constant whirling limits my effectiveness for any longer period," she explained. "If I look at the arm for only a very short period, I become dizzy and ill. One has to become acclimated to the unusual conditions -- I've seen persons get dizzy just by watching from the control room."

The centrifuge is technically called an Acceleration Test Machine. Measurements on it are made in units of "G" forces set up by varying the speed of the arm. One G force is the normal pull of gravity. More G's result if a person or object is submitted to additional accelerations greater than the normal pull. The most familiar example of the force is that experienced by a jet fighter pilot when he pulls his craft out of a supersonic dive, and is subjected to the pull of seven or eight G's. The centrifuge at Hanscom is capable of forces ranging from .3 G to 30 G's.

"The highest reading we have obtained while I was taking readings has been 16 G's," Miss Mueller said. "At that rate, my ears start going 'whing,' 'whing,' 'whing,' and I have to tell the control room to slow down."

Miss Mueller is far from the stereotyped "Dizzy Blonde" in her professional and non-professional activities. As a physicist, she performs many duties at the small (13 employees) test facility. These include drafting, work on optical equipment, aiding in reduction of data, surveying and even some design work on printed circuits.

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As the only woman scientist at the Hanscom facility, and one of the few women scientists in the M.I.T. Instrumentation Laboratory, she has to be versatile. "Many things come along in the course of a day's work," she said. "If I can do them, I do them."

Work in optical equipment and research should come naturally to the scientist, because her father, Dr. Hans Mueller has long been one of the world's experts in optics, and has served as a consultant to governmental agencies while a member of the M.I.T. faculty.

Miss Mueller is of Swiss and Swedish descent, and lives with her parents in Belmont, Mass. The Muellers also have a farm in Pembroke, Mass., and her favorite non-professional interest is her horse "Nugget," a beautiful buckskin with a black mane and tail.

"Nugget is 14 years old, and I've been riding her for 12 years," she said. "In 1952, when I graduated from Jackson College at Tufts, my family gave her to me as a present. Since then, I have spent many pleasant hours riding."

Every year from June to September, Miss Mueller lives at the Pembroke farm, and commutes 56 miles to work at Hanscom Field. This means getting up at 5 a.m., taking care of Nugget, and then driving to work. She usually takes a ride on returning home at night, frequently accompanied by her Sheltie dog.

No "book" scientist, she has many hobbies and activities. She loves dancing, travel, photography, painting, and leather tooling. Last summer, after obtaining a six weeks leave of absence from her supervisor, John M. Buchanan, who is an assistant director of the Instrumentation Laboratory, she and three other girls took an 11,000 mile tour of the United States, concentrating on the

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cities and national parks of the west.

Six years of work in scientific research--three at the Cambridge headquarters of the M.I.T. Instrumentation Laboratory, and the remainder at Hanscom Field -- have convinced Miss Mueller that there's nothing better for a career. "I love my work," she says, and I have as many outside interests, hobbies and activities as any non-scientific young woman."

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