

Miniature worlds explain pollution

By Lisa Brown

For the last four years, a UNL physics professor has been creating miniature universes in his laboratory, in an effort to understand man's effect on earth's atmosphere.

A physics research project headed by James A. R. Samson has already made several major contributions to science which were immediately applicable.

The project has received financial support from the National Aeronautics and Space Administration and the National Science Foundation totaling \$288,500.

Simulated atmosphere

With his staff of five men, including two post-doctoral associates, two graduate students and one undergraduate student, Samson mixes and manipulates his own atmospheres within vacuum containers and bombards them with ultra-violet and X-ray radiation similar to the radiation emitted by the sun.

Special discharge lamps provide a light source which simulates radiation from the sun and reacts with the gases in the vacuum containers.

Samson has specifically designed the equipment used in the project and machinists in the physics lab have built it to his specifications.

He is involved in basic physics

research, the result of which can be related to air pollution if correlated with information from other sources.

Besides the interaction of the sun's rays on the atmosphere, research scientists must also consider the composition of the atmosphere at different heights and the exact intensity of the sun's radiation before it is filtered through two outer regions of the atmosphere, the ionosphere and the ozone layer.

Membranes shield earth

These two gaseous membranes are the result of solar ultraviolet and X-ray bombardment of earth's atmosphere. Both shield the earth from more intense amounts of radiation.

If the ozone layer were not present, more energetic ultraviolet radiation from the sun would reach the earth's surface resulting in eye burns and more skin cancer, as well as seriously affecting the whole environmental cycle of the world.

Samson said that the chemical reactions which harm the ionosphere and ozone layer can be affected by noxious poison of nitric oxides from such sources as nuclear bomb explosions and automobile fumes.

"While we know such sources of pollutants can damage the ionosphere and ozone layer," Samson

said, "there is a need for a better understanding of how quickly the two zones can recover from such environmental shock. That's one apparent reason why basic research into the interaction of radiation with atmospheric gases is important."

The sun creates more ozone to form a new layer after the other is damaged, but it is impossible to calculate how long it will take for the ozone to heal.

Major Achievements.

Samson, who divides his time between class instruction and research, joined the University faculty in 1970. Prior to his position at UNL he was director of research at the Geophysical Corporation of America (GCA) in Boston.

During his study of the interaction between radiation and the atmosphere, Samson has made two major achievements beneficial to other scientific studies in related fields.

The Double Ion Chamber he designed while at GCA is now used in research labs across the country. Another product of his research is a scale for measuring energy levels.

In 1964, he developed the scale for the more energetic ultraviolet light and X-rays and in 1974 he extended it to include more degrees. The United States Bureau of Standards has recently accepted his scale and made it the standard for the nation.

short stuff

All social work students are invited to attend the organizational meeting of the Social Work Students Organization, to be held today at 7 p.m. in the Nebraska Union. Purpose of the meeting will be to elect officers and representatives to committees in the School of Social Work.

"Boston Tea Party", a musical satire on America, will be presented at 8 p.m. today in the Centennial Room of the Union.

Dr. Jesse L. Beauchamp of the Department of Chemistry of the California Institute of Technology will speak Friday at 3:30 p.m. in Hamilton 110. Dr. Beauchamp's topic will be: "Chemistry Without Solvents: New Insights into the Properties and Reactions of Organic and Inorganic Ions in the Gas Phase." Refreshments will be served at 3 p.m. in Hamilton 801. Faculty, students and guests are welcome.

A benefit concert, sponsored by Sunrise Communications, will be given Friday from 7:30 p.m. to 12 p.m. at the Union Ballroom. Featured artists will be Rick and the Rockets, The Sunrise Communications FM Radio Band and Dennis Taylor. Admission is \$1.50. Tickets are available at Dirt Cheap and the Union South Desk.

Students interested in studying abroad next semester or beginning next fall as part of Academic Programs Abroad, an exchange program, should attend an information meeting today at 3:30 p.m. in Oldfather Hall. Students interested in studying in Germany should go to 1138 Oldfather. Those interested in going to Mexico should meet at 1030 Oldfather.



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