

# Detecting Chemicals on the Nanoscale



**James Gole**  
Professor, Physics and Mechanical Engineering

## CURRENT RESEARCH

### Energy efficient sensor and microreactor platforms

Natural gas has become a huge component of the energy market. However, in addition to the gases necessary for energy, deleterious materials including, toluene, benzene, and xylene, are also released into the environment. To combat the harmful effects of the toxic chemicals surrounding us, Dr. James Gole, of Georgia Institute of Technology, uses nanotechnology and the characteristics of materials at the nanoscale to create new devices. Such devices have an unprecedented sensitivity for gases that thereby make them important for improving public health and in decreasing the presence of gases that are deleterious to the environment. Dr. Gole's research therefore helps develop new, energy efficient, simple to implement, and far more sensitive ways to detect and transform harmful environmental contaminants in addition to new means to create catalytic interfaces for energy efficient conversion.

Dr. Gole's novel and unique concept that has led to the creation of highly sensitive, energy efficient sensors is likely to change the futures of public health, environmental justice, and energy. His sensors are capable of detecting harmful chemicals more precisely than ever before. For example, in addition to helping to detect chemicals released by oil wells, Dr. Gole was asked by the San Diego and Georgia police forces to create a device that can more effectively detect phosphine, a chemical produced in Meth labs. Dr. Gole's successful device is one of the world's most sensitive phosphine devices and like the other technologies he has developed, is a major contribution to improving the health and wellness of the communities that it serves. In short, Dr. Gole's orientation towards both the development of new fundamental...

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## AFFILIATION

 Georgia Institute of Technology

## EDUCATION

- Postdoctoral Fellowship, 1974 , Columbia University
- Ph.D., in Physics, 1971 , Rice University
- B.S., in Physics, 1967 , University of California, Santa Barbara

## AWARDS

- Fellow of the American Physical Society
- Fellow of the American Association for the Advancement of Science
- National Science Foundation Undergraduate Research Fellow
- National Science Foundation Postdoctoral Fellow
- Georgia Tech Outstanding Research Author
- and 5 more...

## RESEARCH AREAS

Environment, Chemical, Clean Energy, Remediation

## FUNDING REQUEST

Your contributions will support the continued research of Dr. James Gole, of the Georgia Institute of Technology, as he provides a general approach and concept for energy efficient sensor and microreactor platforms. Donations will support the necessary \$250K required for personnel each year. In choosing to donate, you will play a role in developing new energy efficient technologies to transform harmful environmental contaminants and to create new catalytic interfaces for energy efficient conversion.