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Solar Energy and Materials Technology Division
Applied Sciences Laboratory
Engineering Experiment Station
Georgia Institute of Technology
Atlanta, Georgia 30332

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OTHER FACILITIES

In addition to operating the 400 KWth Solar Thermal Test Facility, Georgia Tech brings to the solar energy community a broad background of experience with other high temperature solar test facilities. Georgia Tech has a continuing research services arrangement with the Centre National de la Recherche Scientifique (CNRS) for high temperature R&D at the CNRS 1000 KWth Solar Furnace at Odeillo, France. Georgia Tech served as a consultant to Black and Veatch, Kansas City in the design of the 5 MWth Solar Thermal Test Facility to be operated by Sandia Laboratories, Albuquerque, New Mexico, and assisted the U. S. Army in the calibration and characterization of the 30 KW Solar Furnace when that was moved to White Sands, New Mexico.

Georgia Tech maintains an active association with these and other high temperature solar test facilities and is interested in developing or in assisting to develop R&D programs which require the capabilities of these facilities.

Persons interested in using the Georgia Tech 400 KW Solar Thermal Test Facility or any of the described facilities or in obtaining more information should contact:

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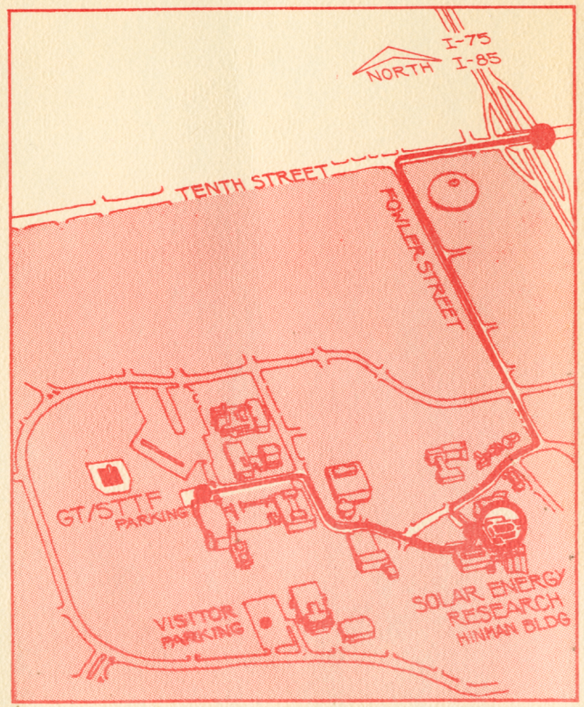
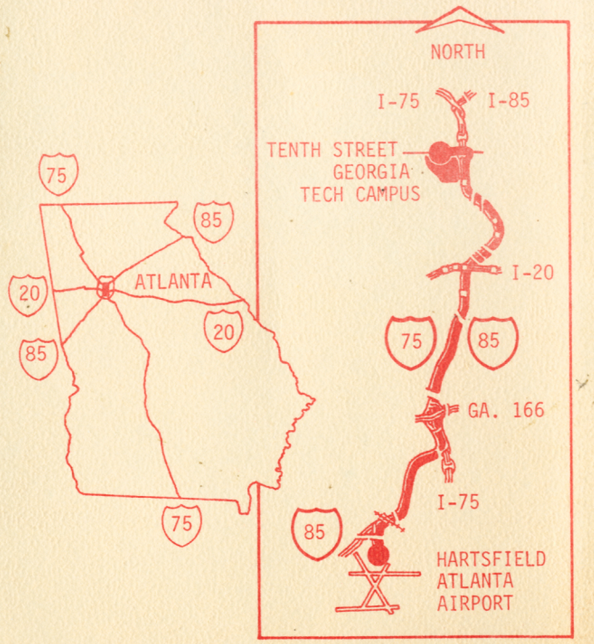
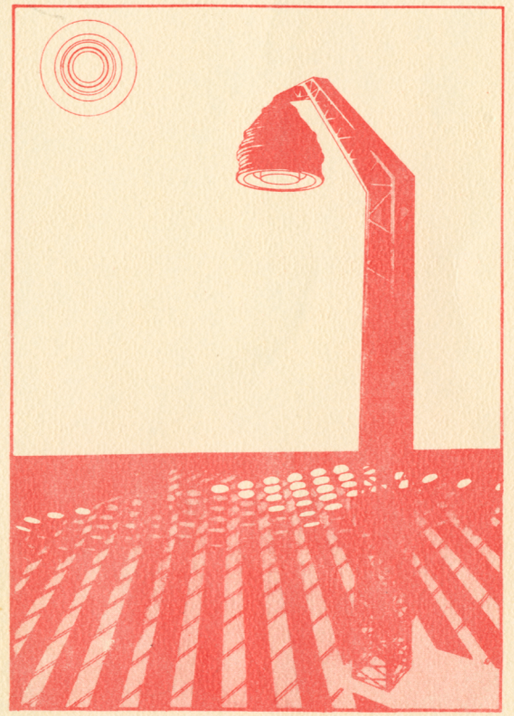




UTILIZING SOLAR ENERGY FOR HIGH TEMPERATURE APPLICATIONS



GEORGIA INSTITUTE OF TECHNOLOGY

SOLAR THERMAL TEST FACILITY

A 400 KWth Solar Thermal Test Facility, funded by the Energy Research and Development Administration (ERDA) has been constructed on the Georgia Tech campus. The Georgia Tech Solar Thermal Test Facility (GT/STTF) provides a place for Private Industry, University and Governmental Laboratories, or qualified persons to evaluate experimental solar thermal conversion components such as steam generators and other heat exchanger devices utilizing such heat transfer fluids as air, helium, oil, molten salts and liquid metals, and basic research in the areas of metals, ceramics and coatings.

CHARACTERISTICS OF THE GT/STTF

The Georgia Tech facility utilizes 550 round mirrors, 111 centimeters in diameter which may be operated flat or focused to provide radiant heat fluxes from 25 to 200 W/cm^2 to a test area centrally located above the mirror field. Each mirror is supported on a mechanical mount called a "kinematic motion" device. All of these devices or heliostats are mechanically linked together through a common drive shaft so that they move together to follow the sun's apparent movement. Power is provided through an electrically-driven clock controlled mechanism.

THERMAL CAPABILITY

The heat flux and thermal power provided by this facility depend upon the number of mirrors, the incident direct solar radiation, the time of day and time of year. Typically, with an incident direct solar flux of 800 - 950 W/cm^2 the nominal radiant heat flux has been calculated to be in the range of 25 to 50 W/cm^2 with the mirrors flat and 50 to 200 W/cm^2 focused. The nominal black body equilibrium temperatures associated with these fluxes are 1100 - 1400^o C for 25 to 50 W/cm^2 and 1400 - 2100^o C for 50 to 200 W/cm^2.

TYPICAL EXPERIMENTS

The GT/STTF provides radiant thermal energy environment which is suitable for a wide range of high temperature experiments. Typical of those related to solar thermal conversion which might be considered are:

RECEIVERS
(Heat Exchangers)
Steam
Hot Air (Gas)
Oil (Hydrocarbons)
Molten Salt
Liquid Metal

STORAGE SYSTEMS
High Temperature
Latent Heat
Chemical

ELECTRIC POWER GENERATION
Mechanical Conversion
Thermionic
Photovoltaic

COATINGS
Heat Exchange Surface
Reflective Surface

MATERIALS
Metals
Ceramics
Composites

OTHER SYSTEMS
Energy Conversion
Total Energy
Hybrid Energy

PLANS FOR USE

Preparation of Experimenters Manual is underway. It describes the operation and capabilities of the GT/STTF. It will include a list of available equipment, instrumentation and other support equipment and will describe procedures to be followed in order to conduct experiments. These procedures will include:

1. Initial Planning
2. Test Plan and Schedule Approval
3. Definition of Test Requirements and Safety Hazards
4. Detailed Test Plan
5. Facility Modifications (if necessary)
6. Facility Adaptation (experiment installation)
7. Test Performance
8. Collection and Organization of Data

COSTS

Costs to the user will be determined on a case-by-case basis and may vary from "no charge" to full cost recovery for the Government. The degree of information made public by the user, the importance of the experiment in terms of state-of-the art frontiers and its relevance to ERDA's mission to develop the use of concentrated solar energy are the primary factors which affect the cost to be borne by the user.

I'M INTERESTED IN UTILIZING CONCENTRATED SOLAR ENERGY

_____
Name

_____
area of responsibility

_____
organization

_____
street address

_____
city state zip

_____
area code phone

_____
principle product/process etc.

☐ I would be interested in using concentrated Solar Energy for ☐ solar thermal conversion processes. ☐ For high temperature R&D.

☐ I have or ☐ I am designing heat exchangers (receivers) which (will) need to be evaluated using concentrated solar energy.

☐ I would like more information on:
- ☐ The Georgia Tech 400 KWth Solar Thermal Test Facility
- ☐ The 5 MWth Solar Thermal Test Facility at Albuquerque, N.M.
- ☐ The CNRS 1000 KWth Solar Furnace, Odeillo, France.
- ☐ The White Sands 30 KWth Solar Furnace.