

SURP & RET Handbook

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INTRODUCTION

Welcome to the 2002 Summer Undergraduate Research Participation (SURP) Program in the Chemistry Department at the University of Alabama. This "SURP" Program is sponsored by the National Science Foundation and the University of Alabama Chemistry Department.

During the next ten weeks, you will be introduced to the challenging field of chemical research. Each one of you will be involved in your own research project in one of some fourteen research labs in the Chemistry Department. Not only will you be able to gain "hands-on" experience in the operation of research grade instruments and computers in our department, but you will also be able to interact with faculty, staff, graduate students, as well as postdoctoral fellows, on a personal basis. We hope you will use the next ten weeks to the utmost, so you can learn as much as possible and have fun also.

Lowell D. Kispert
Chairman, Department of Chemistry
SURP Program Director

SURP & RET Program Expectations

This program is designed to stimulate your interest in chemistry through active full-time participation in a meaningful 10 week research project. The NSF-sponsored SURP program has been designed so that you will develop a confidence and independence in carrying out meaningful research on a topic of current interest and generate a willingness to accept responsibility to report your results to your peers. NSF believes that in this way more students will plan on attending graduate school in science, especially in chemistry. To prepare for a successful professional career, we expect that you will demonstrate your ability to think independently by summarizing your results at the end of the project in a 20-page report and prepare your results for presentation at your college and state, regional or possibly national ACS meetings.

List of SURP Participants Summer 2002

Name & College	Permanent Address	Apt. Advisor & Project Title	Room #
Shannon Audley Univ. of Dallas	Apt. @2100 1750 East Northgate Dr. Irving, TX 75062 (972) 438-6311 antimonie@hotmail.com	Dr. Redding Re-engineering Photo- synthesis to Destroy Environmental Pollutants	1318
Jo Ellen Fory Presbyterian	1213 Rumson Drive Hoover, AL 35226 (205) 823-0433 jefory@presby.edu	Dr. Timkovich Preparation of New and Novel Antibiotics	1318
Shanna Gillespie Virginia Poly- Technic	6307 Battle Rock Dr. Clifton, VA 20124 (703) 266-4382 shgilles@vt.edu	Dr. Vincent Diabetes Research	1318
Keith Green Michigan Tech.	3969 Butternut Ct. Unit E. Port Huron, MI 48060 (906) 483-5151 kdgreen@mtu.edu	Dr. Rogers Investigations of Ionic Liquids as Green Solvents	1317
Jami Heidtbrink Southwest MO State Univ.	18704 E. 20th Terr. N. Independence, MO 64058 (816) 796-7600 jrh473s@smsu.edu	Dr. Bertsch Improved Sample Pre- paration Methodology for Potential Accelerants in Fire Debris	1320
Geoffrey Hudson The Univ. of AL	2012 New Prospect Rd. Jasper, AL 35505 (205) 221-4492 gefaroo202@aol.com	Dr. Arduengo Condensation Prepara- tions of Imidazolium Salts	1319
Robert Jilek Gustaus Adolphus	10 Cardinal Court North Mankato, MN 56003 (507) 345-1610 rjilek@gac.edu	Dr. Thrasher Fluorine Chemistry	1317
Christopher Key University of AL	2111 Lancelot Dr. Decatur, AL 35603 (256) 355-3773 tide04@hotmail.com	Dr. Thrasher Fluorine Chemistry	1317

Name & College	Permanent Address	Advisor & Project Title	Room #
Uriah Kilgore Southeast Missouri	907 E. 9th St. Rolla, MO 65401 (573) 364-6852 ez95stu@semo.edu	Dr. Arduengo Modelling Imidazole H-Bonding	1319
John W. Smith Northwestern St. University	190 Pecania Dr. Ferriday, LA 71334 (318) 757-4273 johnsmith45@hotmail.com	Dr. Woski Nucleic Acid Chemistry	1319
Amanda Stewart Georgia Southern University	166 Lynn Drive Lyons, GA 30436 (912) 526-3632 stewart@hotmail.com	Dr. Vincent Metallotherapeutics	1320
Jay W. Wackerly Winona St. Univ.	2102 Northwood Godfrey, IL 62035 (618) 467-1308 jwwacker2737@ webmail.winona	Dr. Blackstock Developing New Tools for Organic Crystal Synthesis Based in Donor-Acceptor Bonding	1319
Nora R. Wang Univ. of AL - B'ham	1100 County Rd. 781 Cullman, AL 35055 (256) 734-8874 pilarem18@aol.com	Dr. Nikles Detection of Biological Warfare Agents by Magnetic Nanoparticles	1318
Ashlie Wrenne Georgetown Col.	1411 Ashlawn Murfreesboro, TN 37129 (615) 896-1414 lwrebird@mail.com	Dr. Shaughnessy Organometallic Reactions in Ionic Liquids	1320

List of RET Participants Summer 2002

Felecia Briggins Greensboro East School	7201 Alabama Hwy 61 Newbern, AL 36765 FBRIGG@aol.com	Professor Redding Directing Electron Transfer in Photosystem I
Virginia Cole Central High School	326 52nd Street East Tuscaloosa, AL 35405 (205) 752-3741 vcole@chs.tusc.k12.al.us	Professor Woski Nucleic Acid Chemistry
Anne Jones Aliceville High School	606 5th St. NW Aliceville, AL 35442 (205) 373-6252q pieface@pickens.net	Professor Bertsch Improved Sample Preparation Methodology for Potential Accelerants in Fire Debris
Tameka L. Shamery Livingston High School	546 Highland Oaks Dr. Tuscaloosa, AL 35405 (205) 366-1232 shame001@bama.ua.edu	Professor Rogers Teaching Module for Green Separations in High School

2002 SURP & RET PROGRAM June 3 - August 10 University of Alabama Tuscaloosa, Alabama

Schedule of Events in addition to selected projects.

June	3	8:00 a.m.	(Room 103 - Chemistry) Welcome, expectation of program, register cars, laboratory safety, tour of chemistry building, introduction to Science Library etc.
June	3	1:00 p.m.	(Room 103 - Chemistry) Faculty advisors present selected projects to group at large. Notification of the room number of the lab for each project.
		2:15 p.m.	Refreshments
		3:00 p.m.	Begin projects
June	4	8:00 a.m.	Continue projects (Search out location of library)
June	4	7-10 p.m.	Science and Engineering Library, how to use facility and begin literature search (meet initially in Room 103, Chemistry).
June	5	7-10 p.m.	Sci Finder (meet initially in Room 103)
June	7	Friday 1-2 p.m.	First Weekly meeting Room 103, Lloyd Ms. Virginia Cole 326 52nd St. (attendance required every Friday).
June	8	Saturday 9:00 a.m.	Tour of area parks (attendance required) Dr. Szulczewski will provide details

SURP & RET PROGRAM 2002
June 3 - August 10
Faculty Research Seminars
(Monday -Noon)
Room 103

June 10 Monday First Faculty Research Seminar
 12-1 p.m. Room 103, Lloyd)
 bring your own sack lunch
 (attendance required every Monday).

June 12 Wednesday First Seminar on Ethics
 12-1 p.m. (Room 103, Lloyd)
 bring your own sack lunch
 (attendance required every Wednesday).

June 13 4-9 p.m. (Lake Lurleen State Park) PICNIC - students
 faculty and secretaries. **All SURP students
 and RET participants please meet in
 the lobby at 4:00 p.m.**

June 14 1-2 p.m. Publicity and Photo Session (Room 103)

June 15 3:30 p.m. Tour of Gulf States Headquarters (Art Work).
 Meet in Room 103. Attendance required.

July 12 8:00 p.m. Astronomy Show (Physics) Rm 227, Meet in
 Friday Chemistry Lobby. (Attendance required).

July 31 1-2:30 p.m. RET - Final Reports, Room 103 Lloyd
 (20 minutes each)

Aug. 7-8 (Room 103 - Chemistry)
 Final Reports 20 min. Wednesday,
 Thursday; 8 a.m. and 1 p.m.

Aug. 9 (Room 103 - Chemistry)
 Faculty - Student farewell luncheon
 meeting 11:30—>3:30 p.m.
 1—>3 p.m. - complete reports. Special
 instructions for college reports, local and
 national ACS meetings, and applications
 to professional schools. Attendance required.

June 10 Professor Arduengo Eine kurze Zusammenfassung
 der langen Geschichte der
 Carbene

17 Professor Rogers Separation Science in
 Environmental Chemistry

24 Professor Woski Synthesis of Modified Nucleic
 Acids

July 1 Professor Blackstock Crystal Engineering

8 Professor Shaughnessy Reactions in Environmentally
 Benign Solvents

15 Professor Cassady Protein Structure

22 Professor Redding Biological Photochemistry

29 Professor Bakker Meso, Micro and Nano-
 structures by Self Assembly

Aug. 5 Professor Nikles Materials for Information
 Technology

**2002
SEMINAR ON ETHICS
(Wednesday, 12 - 1 p.m.)**

Date	Speaker	Topics
June 12	Joey Parker Assoc. Prof. of Mechanical Engineering The University of Alabama	Industrial Ethics
June 19	Ms. Carolyn Steverson Assistant US Attorney	Government Ethics
June 26	Dr. John Vincent Assoc. Professor of Chemistry The University of Alabama	Scientific Ethics
July 03	Dr. Steven Hobbs Tom Bevill Chairholder of Law The University of Alabama	Legal Ethics
July 10	Dr. Connie Diggs Director Russell Student Health Center The University of Alabama	Medical Ethics
July 17	Dr. Kathleen Cramer Associate Vice-President of Student Affairs The University of Alabama	Academic Ethics
July 24	TBA	Environmental Ethics
July 31	John Vincent	Discussion - Implications of the ethics topics in your project or potential problems. Each student to report for 3 minutes what will be included in the final written report.

**SURP & RET PROGRAM 2002
Research Techniques and Final Reports
Friday, 1:00 p.m., Room 103**

June	7	NMR Facility	Ken Belmore
	14	Publicity & Photo Session	University Relations
	21	Glassblowing Demonstration	Richard Smith
	28	Progress Report 3 minutes each student	Program Committee
July	5	X-Ray Crystallography	Grant Broker
	12	Vac-line Techniques	Prof. Thrasher
	19	Mass Spectrometry	Prof. Cassady & Sharon Webb
	26	Scanning Electron Microscope	Jolanta Nunley
August	2	Surface Analytical Techniques	Prof. Shane Street
		8 a.m.	1 p.m.
	8 (Wed.)	Shannon Audley Shanna Gillespie Jami Heidtbrink	Jo Ellen Fory Keith Green Geoffrey Hudson
	9 (Thurs.)	Robert Jilek Uriah Kilgore Amanda Stewart	Christopher Key John W. Smith Jay Wackerly
	10 (Friday)	None	Nora R. Wang Ashlie Wrenne

MINIMUM SAFETY REGULATIONS FOR RESEARCH LABORATORIES

In order to create safe laboratories and also to meet federal and state safety regulations, the safety rules and procedures, as outlined in the booklet, Chemical Laboratory Safety Manual, have been adopted by the Safety Committee of the Chemistry Department. These rules are not attempts to restrict or hamper research. Instead, they are based on common sense and enacted for the benefit and safety of everyone. Your cooperation is essential. Please attempt to bring your laboratories and your laboratory procedures into conformity with these principles and remind others to do so.

The Safety Committee will make unannounced inspections of the laboratories. All hazards will be recorded, and the students working in that laboratory will be given a list of deficiencies and instructions on their improvement. The deficiencies will also be reported to the faculty research advisor responsible for that laboratory. Furthermore, the laboratory will be reinspected to see that the listed deficiencies have been corrected. A comprehensive listing of all deficiencies found will be compiled so that (a) these problems can be discussed at department-wide safety meetings and (b) so that serious problems or frequently encountered problems may be brought to everyone's attention for immediate resolution.

Each of you can make an important contribution by taking this list and systematically checking and correcting unsafe conditions in your laboratory. Please begin to conduct your laboratory operations in accord with these regulations. Most importantly, please develop a positive attitude about this safety effort. It is each of you who stand to benefit most from these efforts. Later in your career, each of you will probably be responsible for the safety of others working with you. Thus, most of the following regulations are nothing more than procedures which will be with you as long as you are in chemistry. A digest of some of the more common rules and procedures is given in the following pages. For a more complete and authoritative coverage of each of these areas, please consult the Chemical Laboratory Safety Manual.

1. Safety Equipment and Familiarity

- a. Each student must make sure (his, her) laboratory is equipped with a minimum of 1 fire extinguisher per laboratory. They must know the location of and how to use fire extinguishers and fire buckets with sand.
- b. Each student must be aware of the location of and know how to use eyewash fountains, showers, fire-blankets, and emergency kits.

2. Please don't smoke in the laboratories

This is a rather obvious need, particularly since we do not have prescribed smoking areas in the laboratories of Lloyd Hall. If you do smoke, you must go outside the building to smoke. (The danger you create for others who work in the labs could be far greater than the danger inherent in your own operations. It is understood this requires changing well-developed habits to accomplish this task, and your cooperation is vital in this respect.)

3. Eye Safety

- a. Eye protection must always be worn in the laboratory, even when you sit at your desk (i.e. safety glasses, goggles, or shields). If your desk has been appropriately shielded (as per a safety committee inspection), you may remove eye protection while at your desk.
- b. If you don't normally wear glasses, consider purchasing a nonprescription, fitted pair.

4. Storage of Solvents

- a. All solvents should be stored in safety cans.
- b. If it is impossible for you to do this (after trying to get these cans), you still must store the (i) most volatile and the (ii) most toxic solvents in safety cans. For example, acetone, pet-ether, ether, pentane, methylene chloride, and benzene should always be in safety cans. Solvents such as

isopropanol, HMPT, ethylene glycol, pump oil, etc., can be kept in bottles when cans are not available.

- c. Solvent bottles or cans should not be left or kept on bench tops or left in hallways.
- d. Solvents should not be stored on shelves above benches (serious fire spreading hazard).
- e. Solvents should, if possible, be stored in steel cabinets.
- f. If it is impossible to store solvents in steel cabinets, they must be stored in cabinets behind closed doors. In this way, they won't be accidentally broken when something else happens in the lab.
- g. Don't store large quantities of solvents in the lab.
- h. Transportation of chemicals by elevator must be minimized. Only stockroom personnel are permitted to do this.
- i. Transportation of chemicals should be performed in rubber safety buckets. These buckets will be provided in the near future. Meanwhile, only a single bottle of a dangerous chemical should be carried at a time.

5. Storage of Chemicals

- a. Avoid storing chemicals near sinks (for example, LiAlH_4 has been found near a sink. This is extremely dangerous).
- b. Don't store flammable chemicals above bench tops.
- c. All chemicals must be clearly labeled.
- d. Old chemicals or excess chemicals should be periodically collected and either discarded, placed in the central storage location of your faculty advisor, or taken to the stockroom.
- e. Chemicals stored in desiccators under vacuum must be kept in closed cabinets, behind shields, or in cages. Never store such desiccators on shelves above bench tops or on lab benches. Label desiccators which are under vacuum.

f. All gas cylinders must be clamped, and they should be located in areas reserved for gas tanks.

g. Refrigerators:

- 1) Refrigerators must be regularly defrosted.
- 2) Chemicals must be clearly labeled.
- 3) Chemicals should be stored neatly and carefully – not simply "piled in."
- 4) Don't store food in refrigerators containing chemicals.

6. Operations Under Vacuum

- a. Vacuum equipment should be shielded (even glass rotary evaporation units.)
- b. Vacuum pumps must have guards. If not, the pumps must be housed in boxes or housings which serve the same purpose.
- c. See 5-e.
- d. Never evacuate flat bottom flasks, bottles etc.
- e. All Dewar flasks and desiccators must be carefully taped.
- f. Vacuum pump exhausts should have a filter. If not, the pump outlet should be exhausted into a hood.
- g. Glass mercury diffusion pumps should be housed in cases which can catch the mercury if the glass is broken.

7. General Laboratory Operations

- a. All reactions must be labeled. This includes operations under vacuum. (Write on a card exactly what your reaction is). Tape the card to the reaction vessel or nearby. Then if an accident occurs when you are not in the laboratory, others will be able to deal with it. If the power goes off, others will be able to anticipate problem, etc.

- b. Solvent stills should be labeled.
- c. All reactions should be shielded when not attended. (Have your research advisor provide lab shields if you don't have enough shielding).
- d. All permanent solvent stills should be carefully shielded (again, have your faculty advisor arrange for the necessary shielding).
- e. Cylinders should be moved only with the aid of cylinder carts. Pressure regulating gauges should be removed, and cylinder caps should be on. Return cylinders to stockroom while a positive pressure still exists in the cylinder.
- f. Dewars should not be stored on bench tops.
- g. Dewars in use should be clamped. When not in use, store in closed cabinets.
- h. Water hoses on condensers must be wired or clamped on.
- i. Water hoses draining to sinks or troughs must be securely anchored in place.
- j. Broken glassware should be stored in closed cabinets and labeled.
- k. Solvents should not be exposed to air for long periods during chromatography operations.
- l. Never throw rags or paper towels which are wet with solvents into the waste cans. Instead, thoroughly soak them with water prior to discarding them.
- m. Never dispose of waste alumina or silica gel (i.e., from column chromatography) by dumping into waste cans. Instead, thoroughly soak with water before discarding.
- n. Solvent and solid waste disposal should be handled carefully and thoughtfully until the time that we have a standard waste disposal procedure in effect. If any questions arise please contact a member of the safety committee.
- o. Periodically check the electrical cords on variances, heating mantles, motors, etc. for damage. Have them repaired when not in excellent shape.
- p. Have all electrical cords carefully placed out of the way of jacks, hot plates, solvents, etc. when in use.
- q. Electrical cords should not be strung across aisles or along the floor without being properly protected.
- r. Do not eat in the lab. Room 107 is provided for such activity.
- s. Bench tops, hoods, passageways, and floors should be kept neat. The single largest cause of accidents is a cluttered and messy work area.
- t. No power cords should be warm to the touch.
- u. Multiple outlets should have fuses or circuit breakers.
- v. Know where the fuses are in each lab.
- w. High voltage circuits (over 600 volts) should be labeled.
- x. Fuse boxes should be three-pronged.
- y. Electrical cords should be three-pronged.
- z. Know what to do for a person who has had a serious electrical shock.
- aa. Emergency phone numbers should be affixed in each laboratory in an easily visible location.
- bb. After fire extinguishers are discharged, take them immediately to the stockroom and have them replaced.

- cc. Clean up mercury spills with Zn powder to form an amalgam. Then clean up and follow by sprinkling sodium polysulfide or powdered sulfur. Never leave a mercury spill without a thorough clean up!
- dd. Mercury should be stored in hoods. A mercury bubbler should be protected with an activated carbon or mineral oil trap.
- ee. Glassware which is chipped, cracked, broken, or star-cracked should immediately be either (a) fixed (annealed or fire polished etc.) or (b) discarded.
- ff. Students should keep in mind that by redistilling and reusing solvents, the volume which must be disposed of is decreased.
- gg. Use of hot oil for heating purposes can be extremely hazardous because of (1) splattering caused by water falling into hot oil, (2) smoking caused by decomposition of the oil or of organic materials in the oil, and (3) fire caused by overheated oil bursting into flame. Operating baths should not be left unattended unless a high temperature cut off is installed. Precautions should be taken to contain any spills of hot oil caused by breakage or of the baths. Adequate ventilation should be available at the place where the bath will be used. No fiberboard, cardboard or other flammable components should be used in the heating apparatus.
- hh. Flammable chemicals should not be dried in an oven. Glassware, washed with acetone, must be air dried first, prior to being placed in an oven.

KEEPING A RESEARCH NOTEBOOK

GENERAL GUIDELINES

Your research laboratory notebook is a permanent record of the research you perform at the University of Alabama. Careful recording of all pertinent information and data will save you much time when writing manuscripts, as well as your final SURP report. Another person should be able to follow your notebook and sufficiently reproduce your experiments.

Always use permanent ink (waterproof, or ball-point) in your notebook recording. If you have spectra and/or graphs recorded on thermal paper, xerox them, as thermal paper is usually light-sensitive, and important data will fade with time. It is helpful to reduce spectra and graphs (on Xerox machine) and tape them for reference into your notebook.

Leave space in the beginning of your notebook for a TABLE OF CONTENTS.

Number pages, if they are not numbered. Also, date each page and experiment.

Include yields, weights, etc. in your notebook. Don't use scratch paper to record weighing; this usually gets lost.

Each person has their own style to keeping a notebook; it's important, though, that you include enough information in your notebook so that other people can reproduce your work, based upon only following your notebook.

An example of how notebooks are kept follows. You can also consult the ACS Guide to Laboratory Notebooks or your SURP Advisor for more examples.

Please keep your notebook on your desk when you leave - do not lock it up. In case of an emergency, it may be necessary to consult your notebook for the properties of chemicals used in a specific reaction.

Record the results of conversations with visiting scientists concerning your research in your notebook, as well as any important literature references that may pertain to your research.

KEEPING A RESEARCH NOTEBOOK

SUBJECT Bug Repellents
 Continued from page no. 87
 Date 15 May 1968

CHARACTERIZATION OF REPELLENTS

I subjected 100% ortho and para-C₆H₄ to the test. Both are strong and constant at 200-250 ft. ortho is more active than para. I gave the water to the ortho for 10 ft. for the test and found a perfect match to the test. I found that if the ortho can be used in the test.

From suspension bottles of methyl eugenol, piperonal, eugenol, and 200% (Methyl eugenol, 100% piperonal, 100% eugenol) to me from my stockroom. I found that all three had a strong effect on the test. I found that the ortho is the best.

SYNTHESIS OF METHYL EUGENOL BY AROMATIZING ACD

$$\text{C}_6\text{H}_5\text{COOH} + \text{SOCl}_2 \rightarrow \text{C}_6\text{H}_5\text{COCl} + \text{SO}_2 + \text{HCl}$$

$$\text{C}_6\text{H}_5\text{COCl} + \text{C}_6\text{H}_5\text{CHO} \rightarrow \text{C}_6\text{H}_5\text{COCOC}_6\text{H}_5$$

Continued on page no. 88

Prepared by G. R. [unclear] Date 15 May 1968

SUBJECT Bug Repellents
 Continued from page no. 88
 Date 15 May 1968

(Synthesis of [unclear] repellent)

Test repellent used (based on [unclear] repellent)

0.01 (0.015 mols) methyl
 1.15 (0.015 mols) SOCl₂
 1.15 (0.015 mols) ortho-C₆H₄

Experimental Procedure

I used a 20-ml round-bottom flask over 10-100 mesh with a magnetic stirrer. Added 0.01 mol methyl and cooled with thermometer indicated -7°C. Added 1.15 ml SOCl₂ dropwise with stirring (1-2 min). Keep the temp below 15°C. Add 1.15 ml ortho-C₆H₄ and 0.015 parts with stirring. A white paste formed which stopped the stirrer. I removed the flask with replaced it with a water bath heater. Began heating slowly. After 10 minutes temperature was -20°C and the paste began to dissolve. The solvent began to boil. Put a condenser one inch long on the flask and returned 2 ml.

Continued on page no. 89

Prepared by G. R. [unclear] Date 15 May 1968



Rodgers Library for Science and Engineering

The Eric and Sarah Rodgers Library for Science and Engineering is located within a short walk of the chemistry complex and includes a 200,000 volume collection of monographs and over 1,700 current periodicals. The Science and Engineering Library is the first library at the University built with the intent of taking maximum advantage of computer-based information systems for research. The facility includes a scientific communications laboratory containing projection video screens which allow instructors to teach students how to use online data base searching equipment and to operate stand-alone electronic research systems. The Chemistry Department also maintains accounts with Sci Finder for hands-on searching of the chemical literature.

All SURP students will learn more about the Science Library at a Library Orientation during the first week of the SURP program.

RESEARCH FACILITIES AVAILABLE

The University of Alabama Department of Chemistry has 63,450 square feet dedicated to research, with adequate water and power supply as well as air-conditioning. The following research facilities and equipment are available for use:

X-Ray Facilities: Siemens smart CCD area detector system with low temperature device that permits structural solution of approximately 400 crystal structures per year is available.

NMR Facilities: 200 MHz FT multi-nuclear NMR spectrometer, can be operated by the SURP students. In addition, a 360 MHz and a 500 MHz FT NMR spectrometer are available for special applications.

Molecular Modeling Laboratory: Silicon Graphics computer molecular modeling software is available for student use. In addition, five Silicon Graphics workstations, part of the Alabama Supercomputing Network (ASN's) University of Alabama Visualization Laboratory, are available for use by the SURP participants.

Computer Facilities: An IBM-3090-400 with vector processor and a C94A/264 supercomputer is available via ASN Super-computer Network. In addition, there are many personal computers available in the department with Sci Finder capability.

EPR Facilities: A Varian E-12 EPR spectrometer with 9 and 35 microwave bridges, a 100 MHz Transient Recorder for in situ photolysis experiments, an E-800 Varian ELDOR Accessory with an ENDOR attachment, a Bruker-ESP 300-10/7 with a ESP 350-U ENDOR/TRIPLE accessory, a century series 9 GHz, and a newly acquired W-band (95 GHz) EPR Spectrometers.

UV-visible equipment: OLIS-upgraded Cary 14 UV-vis-near-IR spectrophotometer, Fluoro-max fluorescence spectrometer, diode array spectrophotometers including Hewlett-Packard 8453, Shimadzu UV-160 A with temperature control and an Edinburgh Instruments LP900 Laser Flash-Photolysis UV/Vis Spectrophotometer with 10-ns time resolution are available.

CHEMISTRY DEPARTMENT DIRECTORY

Electrochemical Equipment: A-BAS-100, two BAS CV-27 potentiostats with Hewlett-Packard X-Y recorders and PAR-273 with model 96 potentiostat/galvanostats are available in the department. Equipment is also available for inert atmosphere electrochemistry.

Inert Atmosphere Equipment: Numerous Vacuum Atmosphere glove boxes are housed in the department for inert atmosphere manipulations.

Photochemical Reactor Equipment: Rayonet Photochemical Reactor is available for photolysis around 325-350 nm. Several mercury immersion lamps, both low and high pressure (Hanovia and Heraeus), are also available.

Gas Chromatography/Mass Spectrometer Facilities: Hewlett-Packard 5985-A and a VG AUTOSPEC double focusing mass spectrometer with GC and FAB inlets.

IR Equipment: Several FT-IR spectrophotometers are available.

Support Services: Full-time machine shop staff person, one electronics shop technician, as well as one scientific glassblower are all available for use. In addition, a Research Associate is available for consultation and technical expertise in FT-NMR and FT-IR spectroscopy.

Laser Lab: Quartel brilliant Nd:YAG laser, a OPOTEK Magic Cube OPO tunable laser, a Questek model 5200 B dye laser, and a molecular pulsed nitrogen laser are available for transient photolysis studies.

Secretarial/Office Facilities: Three departmental secretaries, 2 photocopying machines, wordprocessing and laser-printer facilities are available.

Faculty

Person	Lloyd Room Number
Dr. A. Arduengo	111-A
Dr. M. G. Bakker	335
Dr. W. Bertsch	225
Dr. S. Blackstock	111-B
Dr. H. L. Blewitt	220
Dr. C. Cassady	218-A
Dr. M. P. Cava	344
Dr. J. K. Cha	111-C
Dr. L. D. Kispert	119
Dr. R. M. Metzger	210-A
Dr. D. E. Nikles (Bevill, Room 229)	244
Dr. K. Redding	215
Dr. K. Shaughnessy	218-B
Dr. R. D. Rogers	124
Dr. S. Street	325
Dr. G. Szulczewski	054
Dr. J. S. Thrasher	355
Dr. R. Timkovich	248
Dr. J. B. Vincent	251-A
Dr. S. Woski	245

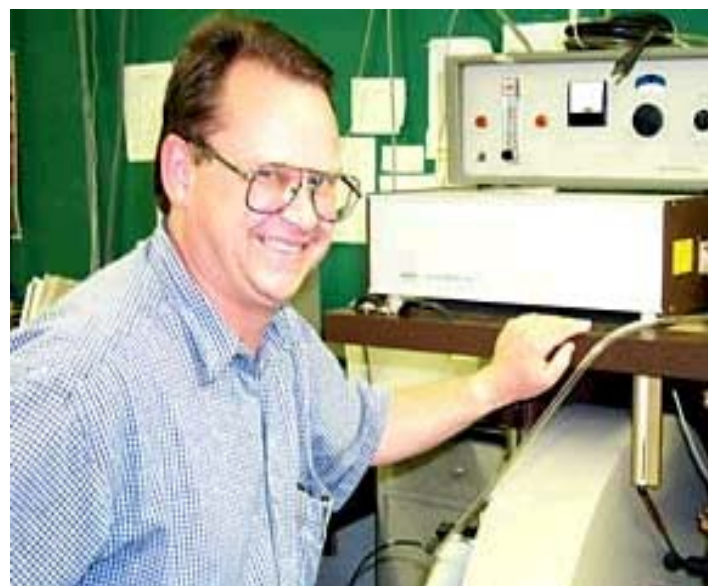
Faculty



**Dr. Lowell Kispert
Chairman & Research Professor
Director, SURP & RET Program**



Dr. Anthony Arduengo



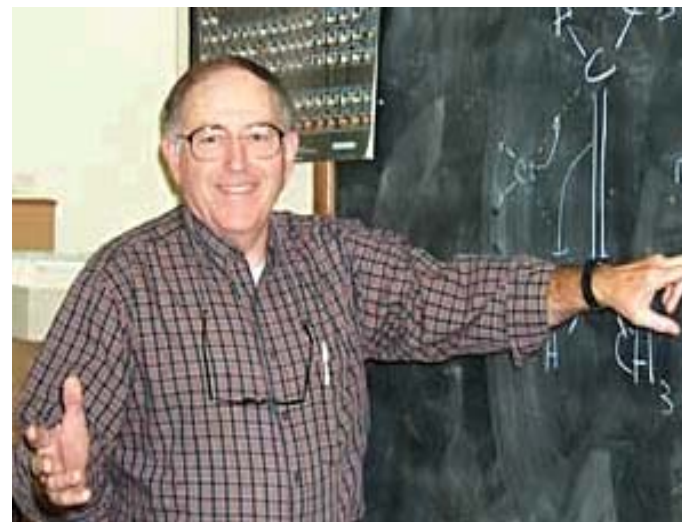
Dr. Martin Bakker



Dr. Wolfgang Bertsch



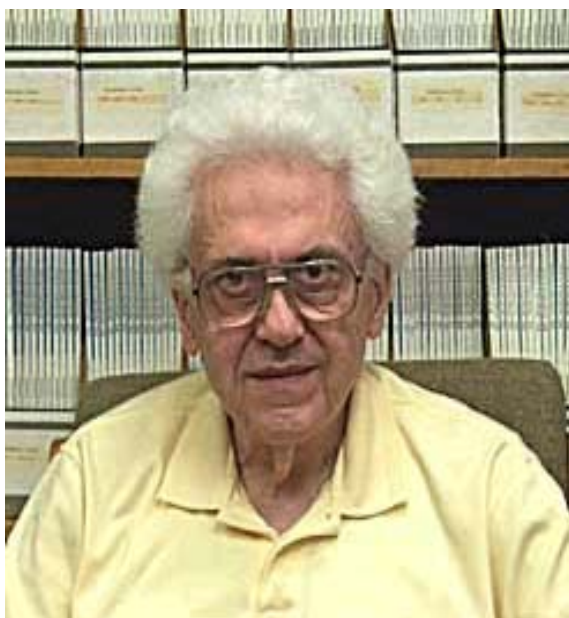
Dr. Silas Blackstock



Dr. Harry Blewitt



Dr. Carolyn Cassady



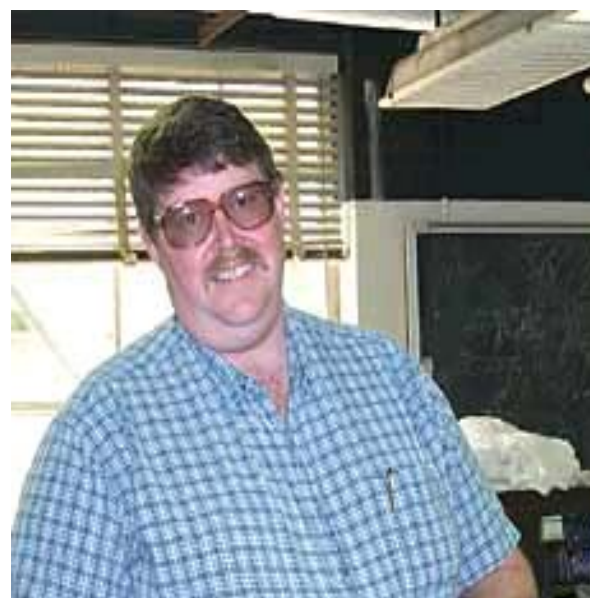
Dr. Michael Cava



Dr. Robert Metzger



Dr. Jin Cha



Dr. David Nikles



Dr. Kevin Redding



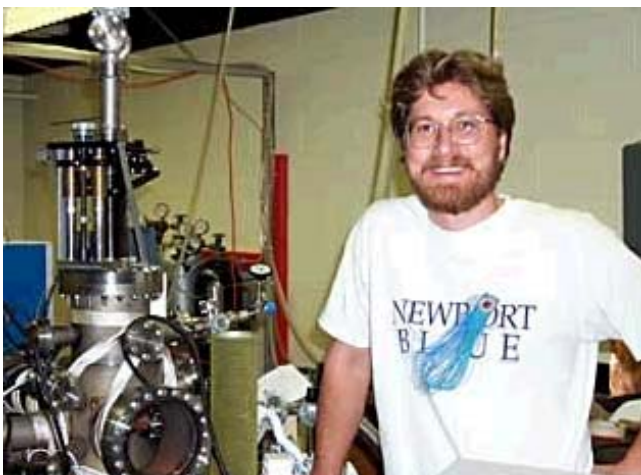
Dr. Kevin Shaughnessy



Dr. Robin Rogers



Dr. Shane Street



Dr. Gregory Szulczewski



Dr. Joseph Thrasher



Dr. Russell Timkovich



Dr. John Vincent



Dr. Stephen Woski

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Mass Spectrometry Manager

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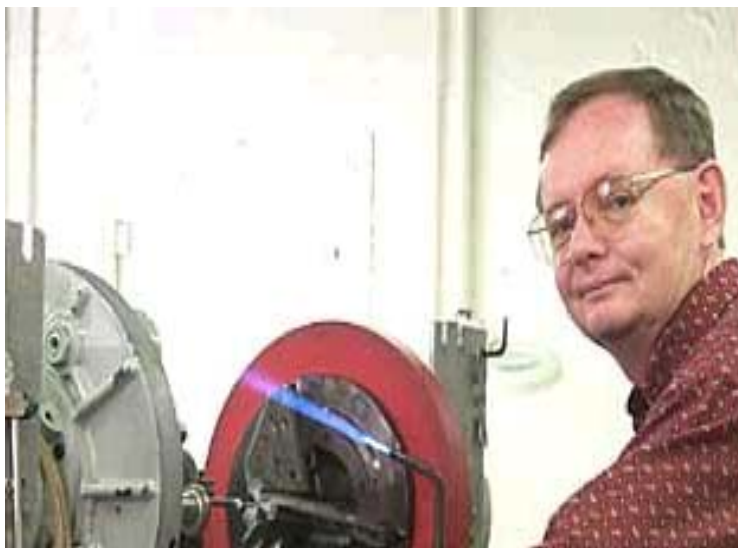


Jackie McPherson
Secretary to the Chairman



Marlene Jones
Accounting Clerk

Carolyn Walker
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Richard Smith, Departmental Glassblower



Ken Belmore
NMR Lab Manager



Michael McLemore
Electronics Technician Senior



David Key
Senior Mechanician



Valerie Knott-Hudson Janice Voss Evelyn Jackson

Departmental Secretaries

SURVEY: YOUR COMMENTS ABOUT THE PROGRAM

At the end of your stay at The University of Alabama, we would like for you to make a list of things your likes/dislikes about the program and ways to make it a better program.

In doing so you can help evaluate what works better in helping students to obtain more knowledge about research and chemistry.

Your comments may be anonymous.

Thank you.