

Student Technology Fee

Grant Proposal

2010.003

2009-10

Tracy Brown



Approved

Denied

Comment: _____

Diana Hamilton



Approved

Denied

Comment: _____

Gary Gatch



Approved

Denied

Comment: _____

Mike McDonald/James Leonards

Approved

Denied

Comment: _____

Dale Martin

Approved

Denied

Comment: _____

Student Technology Fee
Grant Proposal Request Form
Fiscal Year 2009-10

FF

3
2010.003

Northwestern State University of Louisiana

ALL BLANKS MUST BE FILLED COMPLETELY

Prepared by: Gillian E. A. Rudd, PhD For: Student Tech. Grant 2009-2010

Department/Unit: Chemistry & Physics College: Science & Technology
Campus: Natchitoches

Which NSTEP Goals/Objectives does this project meet? #1,3,7 and 8

Requested equipment will be located/installed/housed? Building Fournet Hall Room 211

Are department property policies and procedures in place for requested equipment? Yes

Which individual will be responsible for property control of the requested equipment?

Signature: Gillian E. A. Rudd Date: 26th October, 2009

Grant Proposal Requested Amount: \$ 5,650.00 Budget Attached (circle one): YES NO

Grant delivered to Student Technology located in Watson Library, Room 113. Date _____

The grant proposal must include all specifications, description, model number, quotation, cost, state contract number, and vendor for each item. If the proposal does not include all requested information, it will be returned to requestor.

1. Describe target audience.

All Louisiana Scholars' College and Northwestern students who take the following laboratories sessions: CHEM1091 (pre-nursing); CHEM1031/CHEM1041 (general chemistry); CHEM3011/3021 (organic); CHEM2111 (quantitative analysis); CHEM2141 (inorganic); CHEM4041 (biochemistry) and all physics laboratories.

2. Describe project/initiative for which you are requesting funds.

In the Fall of 2006, the Department of Chemistry & Physics was awarded Student Technology funding to buy a new Fourier Transform Infrared Spectrometer (FT-IR). This instrument does not have any specialized sampling accessories and hence, our samples have been restricted to those that are liquids and/or solids that will dissolve in organic solvents and which can be placed upon sodium chloride plates.

The sodium chloride plates are not robust or inert: they break easily and they react with water from the air and from the student's samples and so fog up. It also takes about 5-10 mins. per student to prepare their sample between a set of sodium chloride plates (which in a class of x24 students, can quickly add up).

This project proposes to purchase a Thermo Scientific Smart iTR, which is an ultra-high performance, versatile Attenuated Total Reflectance (ATR) sampling accessory with a diamond crystal. This crystal (as opposed to the zinc selenide or germanium configurations) is especially robust and is excellent for the analysis of hard, abrasive, reactive, caustic or corrosive materials. It is fully compatible with our Thermo Scientific Nicolet FT-IR.

The sample is pressed into the ATR crystal using a high pressure tower to provide consistent results (which reduces sample preparation and instrument use waiting time) and samples can include:

- Most solids
- Liquids ranging from pH 1 to 14
- Acidic or alkaline materials
- Fibers
- Hard or oddly shaped samples
- Abrasive, caustic or corrosive materials
- Large or small samples
- Paint chips

The rationale for this project encompasses the use of a modern lab FT-IR sampling accessory to improve student technology and the student "feel good factor" because there will be no sample preparation time, no frustration over broken sodium chloride plates and a greater variety of sample applications.

3. State measurable objectives that will be used to determine the impact/effectiveness of the project.

(i) Objective 1: Enhancement of Student Instruction in Laboratory Course

FT-IR is an essential component of the organic, biochemistry, analytical and inorganic labs. Since Fall 2006, we have a reliable instrument so that we are able to function at a "basic" standard of teaching and research. However, the new sampling accessory will enable our students to be more competent in a technological workforce by promoting their science and technology skills. Students will see relationships between instrumental analyses and medical tests. They will do detailed and meticulous preparation of samples for analysis and will learn how to gather and interpret data. The named Smart iTR accessory is what they use in modern laboratories e.g. our Student Affiliates American Chemical Society Chapter members, have seen this accessory in action at the Shreveport Crime Laboratory- as one of our former chemistry majors, Alanna Brauer, now works there. Unfortunately for Alanna, we did not order this accessory with the new FT-IR and she had to "learn on the job" with this accessory.

The new sampling accessory will provide more time for quality student instruction and amplification of the student "feel-good" factor.

It will also tie in with the University's cyberspace summer camp for students in the summer of 2010 (first one was held this summer); in that we can sample say paint chips or fibers-

something that we are not currently able to do.

(ii) Objective 2: Augmentation of Student Abilities in Obtaining and Interpreting Data by Providing Experiences with Organic, Inorganic and Biochemical Compounds

-in the organic and biochemistry labs

Rudd (PI) already has established biochemistry and organic experiments for the use of the FT-IR: the new Smart iTR will allow the students to obtain more reliable results, with no preparation time and spend more time analyzing their results and searching the FT-IR library of databases. They will become proficient at collecting and handling more data and performing repetitive tasks.

-in the general and pre-nursing labs

The new "student-proof" FT-IR accessory will be rugged and easy enough to use, that these students will not have to be learn "complex" and possibly off-putting sample preparation techniques. They will simply press their sample onto the ATR crystal, using the high pressure tower, and the rest is computer driven.

-in the analytical and inorganic labs

The new FT-IR sampling accessory will enable these instructors to make the inorganic and analytical laboratories to be more instrumentation proficient and friendly.

4. Indicate how each project objective will be evaluated.

The goals and objectives of any educational program must include cognitive and attitudinal assessments. We will assess improvements in cognitive skills with pre-testing and post-testing, using tests that we will develop. We will use ACS exams as guidelines only (bearing in mind the strict rules governing ACS exams), to establish an appropriate level of testing. Attitudinal assessments will be conducted using a 5-point Likert scale. All pre-tests will be implemented in the general, organic, inorganic and biochemistry laboratories in January 2008 with post-testing scheduled for May 2008.

Furthermore, the effectiveness of this project will be determined by the student retention between general chemistry I and II, whereby the lab is a pre and/or co-requisite to the course.

5. If funded, which NSTEP <http://www.nsula.edu/nstep/NSTEP.pdf> objective(s) will this funding of this project advance. How will funding of the project advance the University and College/unit technology plan?

(i) University Goals

University Goal # 1, "to attain accreditation for each eligible degree program by a Board of Regents' approved national accrediting agency," and #5 "to develop and implement a system of resource, commitment and allocation in order to increase excellence in academic and professional programs," are both encompassed by this project. We are required by American Chemical Society (ACS) professional standards to maintain a reliable FT-IR instrument for laboratories as well as all associated sampling accessories which are required for the successful running of most laboratories. It will be shown that more fulfilled students who attain hands-on experience with modern instrumentation, will make for a better future work-force.

(ii) NSTEP objectives

Objectives #1, 3, 7 and 8 are encompassed by this project. i.e. #1 states "to improve access to technology by students, faculty, and staff at NSU"; #2 states "to upgrade student technology

laboratories with modern technology"; # 7 states "to establish processes that encourage technology initiatives by faculty, staff, and students" and # 8 states "to encourage innovation and research." All four objectives emphasize the importance of technology based research, and it is important to keep updating our laboratories to keep in-line with equipment used in the workplace (e.g. Shreveport Crime Laboratory): without this, the quality of our students' learning environment is significantly diminished, the frustration factor increases and more time is spent on unnecessary and sometimes lengthy sample preparation.

6. Provide a justification for funding of this project. Estimate the number of student that will be served per academic year and in what ways. Please indicate also any unique needs of the target group.

(i). Impact on Curriculum and Instruction

The students will receive a higher quality laboratory experience during their first year chemistry and they will utilize tools important for their education, which includes the Smart iTR accessory to analyze materials that we are currently not able to sample (e.g. paint chips, fibers, oddly shaped samples etc), obtain decent data and then interpret the data. These students will receive a laboratory experience not focusing on the short-term knowledge, but will develop an inquiry skill to propel them through their careers as a scientist.

Beyond the general chemistry, the project will continue to develop the students understanding for and appreciation of chemistry. These students will: be exposed to a more in-depth laboratory inquiry skill in inorganic chemistry with the alteration of their procedures to include more and varied sampling with the FT-IR; have a better understanding of the investigation tools for analysis using the Smart iTR and obtain decent results from upper level biochemistry labs using the new accessory as well. All of these improvements will help to build the students confidence in chemistry as well as their understanding of it as a career.

It is also hoped that our 2000 level practicum for chemistry teaching course (a supervised experience in teaching in the chemistry lab, which is recommended for secondary education chemistry majors) will be involved in educating all other students on the functioning and operation of the easier to use sampling accessory for the FT-IR.

(ii). Impact on Quality of Students

We expect the new approach described in this proposal to significantly improve student understanding and retention of the course material. This in turn will help to improve student satisfaction, which will have the effect of encouraging more college students to pursue a career in mathematics, science and engineering. The introduction of modern technology aiding in the collection of data, should inspire all of our students. After all, what student, if given the choice, would decide to take their major in an outdated department?

(iii). Impact on Faculty Development

This project will offer faculty the basis on which to develop new forensic-style laboratories and the opportunity to study projects in a more challenging manner with their students. Faculty will be teaching skills required for successful inquiry based problems, which our students will then learn and utilize. Enhancement of chemical pedagogy, will take the students from the mediocre experience of chemistry to a more in-depth understanding of the field. The same can be said for having more efficient sampling accessories for our instrumentation that enables faculty to carry out research, obtain concluding results and present successful research.

7. List those individuals who will be responsible for the implementation of the project/initiative and indicate their demonstrated abilities to accomplish the objectives of the project.

PI Rudd, Associate Professor of Chemistry, holds the Ph.D. in organic medicinal chemistry from the University of Warwick (England). She spent two years as a post-doctoral fellow for F. G. A. Stone at Baylor University, where she gained significant experience in $^{11}\text{B}\{^1\text{H}\}$ NMR, $^{11}\text{B}\text{-}^1\text{H}$ HETCOR and FT-IR. Since joining the NSU faculty (1998) she has taught upper level biochemistry, organic chemistry, and instrumental analysis, as well as lower level introduction to chemistry and biochemistry courses for pre-Nursing and other pre-Health students and general majors' chemistry.

8. Describe any personnel (technical or otherwise) required to support the project/initiative.

None required.

9. Provide a schedule for implementation and evaluation.

The evaluation methods (see 4) will clearly indicate whether benchmark dates have been met and whether cognitive improvements have occurred. Attitudinal surveys will determine whether students "feel" more informed, more motivated, and more appreciative of FT-IR sampling accessory training experiences that reinforce the subject matter. As improved recruitment of quality students is an aspect of the proposal, numbers of incoming students, as well as their GPAs and ACT scores, will demonstrate whether this has been achieved. Finally, numbers of students enrolling in our entire lab based pre-professional programs, numbers that subsequently applied to the programs, and percent success rates will provide a complete picture of the project's impact on our curriculum

10. Estimate the expected life of hardware and software. Explain any anticipated equipment/software upgrades during the next five years.

The sampling accessory for the FT-IR comes with a one year warranty, to cover non-consumable parts and labor to correct defects in workmanship and/or materials when defects have not been caused by misuse or abuse. It is built-to-last and the diamond ATR has been chosen for its "student-proof" ruggedness and with excellent care it should perform for many years.

11. Explain in detail a plan and policy that will be in place to ensure property security/controls for any equipment received through a Student Technology Fee. If you are requesting equipment that will be either/or checkout to students or moved within the department, you must provide a checkout/loan policy

(i) Property security

All materials obtained through this project will be protected under the Department of Chemistry & Physics removable property guidelines (and tagged with the NSU bar code).

(ii) Cost Effectiveness?

It is estimated approx. well over x1000 students per year requiring our labs (excluding any physics students) and with a budget of \$5650 we consider \$5.65 per student to be very cost effective.

12. Detailed budget include all specs, pricing and vendors. Any incomplete proposal will be returned.

Name	Supplier	Price	Quantity	Total
Description				
iTR ATR diamond and high pressure clamp <i>Quote number: 20095788</i> <i>(refer to attached quote)</i>	Thermo Electron North America LLC	\$5,600 and approx \$50 shipping costs	One	\$5,650
Smart iTR with diamond plate for iS10: includes single reflection diamond with ZnSe lens, a high pressure tower and it's for iS10, iZ10 and x700.				

Attach two (2) letters of support for the project from the following individuals: the requesting department's Dean, the appropriate Vice President (for non-academic units), or the SGA President from the requesting campus (for student requests).

Student Technology Fee Grant Proposal Checklist:

- Is all information requested provided (items 1-11)?
- Is a detailed budget attached?
- Is all specifications, description, model number, quotation, cost, state contract number, and vendor provided for each item?
- Are your two (2) letters of support attached?
- If equipment is to be checked out/loaned, is your policy attached?

Gillian Rudd

From: Simonis, Jeffrey J. [jeffrey.simonis@thermofisher.com]
Sent: Wednesday, October 21, 2009 10:54 AM
To: Gillian Rudd
Cc: Gearhart, Jeff
Subject: Smart iTR Quotation
Attachments: 20095788 - NORTHWESTERN STATE UNIV.pdf

Hello Gillian,

I received your voicemail.

Here is the updated quotation you requested I send to you regarding the Smart iTR accessory. Please let me know if I can be of further assistance.

To expedite your order, please reference this quotation number on your purchase order. To pay by credit card, please call 1-800-532-4752, Option 2.

Thank you for doing business with Thermo Fisher Scientific.

Have a great day!

Jeffrey Simonis
Aftermarket Sales
Thermo Scientific
Thermo Fisher Scientific
5225 Verona Road
Madison, WI 53711
608-276-6191 (Office)
608-273-5045 (Fax)
Email: jeffrey.simonis@thermofisher.com

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Sales Quotation

Thermo Electron North America LLC

Quote No.	Create Date	Exp. Delivery Time	Page
0020095788	09/29/2008	* 6-8 wks ARO	1 / 5
Contact Info	Phone No.	Payment Terms	Valid To
JEFF GEARHART	608-276-6161	NET 30 DAYS UPON INVOICE DATE	12/21/2009
Inco 1	Inco 2	Shipping Method	
Origin - Prepay And Add	PREPAY AND ADD	Fed Ex Ground	

1400 Northpoint Pkwy Ste 50,
West Palm Beach, FL 33407-1976

Submitted To: 0001034931

GILLIAN RUDD
NORTHWESTERN STATE UNIVERSITY
CENTRAL RECEIVING
998 SOUTH JEFFERSON
NATCHITOCHE LA 71497

tel: 318-357-5232

Lead - 2194

Model - Nicolet 380
System Serial Number - AGL0702002
Email - Rudd@nsula.edu

To place an order

Call: 800-532-4752
Fax: 608-273-5045
eMail: Jeff.Gearhart@ThermoFisher.com

This order is subject to instructions and Thermo Fisher's terms & conditions on the last page

Item	Material No.	Description	Qty	Unit Price	Total Price
10	222-247000	ITR ATR DIAMOND AND HP CLAMP	1 EA		5,600.00 USD

Smart iTR with Diamond Plate for iS10

- ~ Includes Single Reflection Diamond with ZnSe lens
- ~ Includes a high pressure tower
- ~ For iS10, iZ10 and x700

Total 5,600.00 USD

*****Note*****

All purchase orders must reference the following information:
Thermo Electron North America LLC
5225 Verona Road
Madison, WI 53711

To expedite your order, please include the quotation number on your purchase order.

Sales Quotation

Thermo Electron North America LLC

Quote No.	Create Date	Exp. Delivery Time	Page
0020095788	09/29/2008	* 6-8 wks ARO	2 / 5
Contact Info	Phone No.	Payment Terms	Valid To
JEFF GEARHART	608-276-6161	NET 30 DAYS UPON INVOICE DATE	12/21/2009
Inco 1	Inco 2	Shipping Method	
Origin - Prepay And Add	PREPAY AND ADD	Fed Ex Ground	

1400 Northpoint Pkwy Ste 50,
West Palm Beach, FL 33407-1976

To place an order
 Call: 800-532-4752
 Fax: 608-273-5045
 eMail: Jeff.Gearhart@Thermofisher.com

Item	Material No.	Description	Qty	Unit Price	Total Price
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Quote does not include taxes or shipping charges

Any questions on quote, please contact
 Jeff Gearhart
 Phone – (608)276-6161
 Fax – (608)273-5029
 Email Jeff.Gearhart@Thermofisher.com

All purchase orders must have a copy of the quotation attached or the quotation number must be listed on the purchase order.

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3. **TAXES AND OTHER CHARGES.** Prices for the Products exclude all sales, value added and other taxes and duties imposed with respect to the sale, delivery, or use of any Products covered hereby, all of which taxes and duties must be paid by Buyer. If Buyer claims any exemption, Buyer must provide a valid, signed certificate or letter of exemption for each respective jurisdiction.
4. **TERMS OF PAYMENT.** Seller may invoice Buyer upon shipment for the price and all other charges payable by Buyer in accordance with the terms on the face hereof. If no payment terms are stated on the face hereof, payment shall be net thirty (30) days from the date of invoice. If Buyer fails to pay any amounts when due, Buyer shall pay Seller interest thereon at a periodic rate of one and one-half percent (1.5%) per month (or, if lower, the highest rate permitted by law), together with all costs and expenses (including without limitation reasonable attorneys' fees and disbursements and court costs) incurred by Seller in collecting such overdue amounts or otherwise enforcing Seller's rights hereunder. Seller reserves the right to require from Buyer full or partial payment in advance, or other security that is satisfactory to Seller, at any time that Seller believes in good faith that Buyer's financial condition does not justify the terms of payment specified. All payments shall be made in U.S. Dollars.
5. **DELIVERY; CANCELLATION OR CHANGES BY BUYER.** The Products will be shipped to the destination specified by Buyer, F.O.B. Seller's shipping point. Seller will have the right, at its election, to make partial shipments of the Products and to invoice each shipment separately. Seller reserves the right to stop delivery of Products in transit and to withhold shipments in whole or in part if Buyer fails to make any payment to Seller when due or otherwise fails to perform its obligations hereunder. All shipping dates are approximate only, and Seller will not be liable for any loss or damage resulting from any delay in delivery or failure to deliver which is due to any cause beyond Seller's reasonable control. In the event of a delay due to any cause beyond Seller's reasonable control, Seller reserves the right to terminate the order or to reschedule the shipment within a reasonable period of time, and Buyer will not be entitled to refuse delivery or otherwise be relieved of any obligations as the result of such delay. Products as to which delivery is delayed due to any cause within Buyer's control may be placed in storage by Seller at Buyer's risk and expense and for Buyer's account. Orders in process may be canceled only with Seller's written consent and upon payment of Seller's cancellation charges. Orders in process may not be changed except with Seller's written consent and upon agreement by the parties as to an appropriate adjustment in the purchase price therefor. Credit will not be allowed for Products returned without the prior written consent of Seller.
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Notwithstanding the foregoing, Products supplied by Seller that are obtained by Seller from an original manufacturer or third party supplier are not warranted by Seller, but Seller agrees to assign to Buyer any warranty rights in such Product that Seller may have from the original manufacturer or third party supplier, to the extent such assignment is allowed by such original manufacturer or third party supplier.

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October 22, 2009

To Members of the Student Technology Selection Committee:

Please accept this letter of support on behalf of Dr. Gillian Rudd of the Department of Chemistry and Physics for purchase of a smart iTR accessory. This technology will considerably improve the flow of laboratory students who require the use of the Fourier Transform IR (FTIR) during "rush hour" when analysis of samples is required. What's more, this will also increase one hundred fold, the type of samples that can be analyzed e.g. toxic liquids, paint chips etc.

Thank you for your consideration of this proposal.

Sincerely,

Austin L. Temple, Jr., Ph.D.
Dean, College of Science and Technology



April French, Ph.D.
Department of Chemistry and Physics,
Northwestern State University,
Natchitoches, LA 71497
Tel: 318 357 5248 Fax: 318 357 4219
Email: frencha@nsula.edu



October 26, 2009

Dear Committee Members:

I am pleased to write this letter of support in behalf of a grant proposal written by Dr. Gillian Rudd. Dr. Rudd is proposing to upgrade the chemistry and physics laboratories in the Department of Chemistry and Physics. Funds from this grant will be used to purchase an ultra-high performance, versatile Attenuated Total Reflectance (ATR) sampling accessory for our FT-IR. With the new technology, waiting time for the instrument will decrease, and this should increase student awareness of sampling techniques. The upgrade will affect all students who are taking chemistry or physics laboratory based courses.

Thank you for serving on this very important committee and for your consideration of this proposal.

Very truly yours,

A handwritten signature in cursive script that reads "April N. French".

Dr. April N. French
Assistant Professor of Chemistry
Department of Chemistry & Physics