02 INFORMATION ABOUT PRINCIPAL INVESTIGATORS/PROJECT DIRECTORS(PI/PD) and co-PRINCIPAL INVESTIGATORS/co-PROJECT DIRECTORS

Submit only ONE copy of this form **for each PI/PD and co-PI/PD** identified on the proposal. The form(s) should be attached to the original proposal as specified in GPG Section II.B. Submission of this information is voluntary and is not a precondition of award. This information will not be disclosed to external peer reviewers. ***DO NOT INCLUDE THIS FORM WITH ANY OF THE OTHER COPIES OF YOUR PROPOSAL AS THIS MAY COMPROMISE THE CONFIDENTIALITY OF THE INFORMATION.***

PI/PD Name: Herbert L Dershem

Gender: ☒ Male ☐ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino ☐ Not Hispanic or Latino

Race: (Select one or more)
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☒ White

Disability Status: (Select one or more)
- ☐ Hearing Impairment
- ☐ Visual Impairment
- ☐ Mobility/Orthopedic Impairment
- ☐ Other
- ☒ None

Citizenship: (Choose one) ☒ U.S. Citizen ☐ Permanent Resident ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name): ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project ☒

Ethnicity Definition:
Hispanic or Latino. A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
Race Definitions:
American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

WHY THIS INFORMATION IS BEING REQUESTED:

The Federal Government has a continuing commitment to monitor the operation of its review and award processes to identify and address any inequities based on gender, race, ethnicity, or disability of its proposed PIs/PDs. To gather information needed for this important task, the proposer should submit a single copy of this form for each identified PI/PD with each proposal. Submission of the requested information is voluntary and will not affect the organization's eligibility for an award. However, information not submitted will seriously undermine the statistical validity, and therefore the usefulness, of information recieved from others. Any individual not wishing to submit some or all the information should check the box provided for this purpose. (The exceptions are the PI/PD name and the information about prior Federal support, the last question above.)

Collection of this information is authorized by the NSF Act of 1950, as amended, 42 U.S.C. 1861, et seq. Demographic data allows NSF to gauge whether our programs and other opportunities in science and technology are fairly reaching and benefiting everyone regardless of demographic category; to ensure that those in under-represented groups have the same knowledge of and access to programs and other research and educational oppurtunities; and to assess involvement of international investigators in work supported by NSF. The information may be disclosed to government contractors, experts, volunteers and researchers to complete assigned work; and to other government agencies in order to coordinate and assess programs. The information may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records", 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records", 63 Federal Register 268 (January 5, 1998).

List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 04-23

NSF 07-524 **02/16/07**

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)

DUE - S-STEM:SCHLR SCI TECH ENG&MATH

FOR NSF USE ONLY

NSF PROPOSAL NUMBER

0728574

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
02/16/2007	2	11040000 DUE	1536	050947084	02/18/2009 5:19pm S

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)

381381271

SHOW PREVIOUS AWARD NO. IF THIS IS
☐ A RENEWAL
☐ AN ACCOMPLISHMENT-BASED RENEWAL

IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE

Hope College

AWARDEE ORGANIZATION CODE (IF KNOWN)

0022731000

ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE

Hope College
141 E. 12th
Holland, MI. 494229000

NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE

PERFORMING ORGANIZATION CODE (IF KNOWN)

ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)
☐ SMALL BUSINESS ☐ MINORITY BUSINESS
☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS

☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT **Scholarships for Transfer Students in Science, Engineering, and Mathematics**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **564,360**	**60** months	**09/01/07**	

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.A)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.B, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.1)
☐ VERTEBRATE ANIMALS (GPG II.D.5) IACUC App. Date _____
☒ HUMAN SUBJECTS (GPG II.D.6)
Exemption Subsection _____ or IRB App. Date **04/10/06**
☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j)
_____
☐ HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1)

PI/PD DEPARTMENT
Department of Computer Science

PI/PD FAX NUMBER
616-395-7123

PI/PD POSTAL ADDRESS
27 Graves Place

Holland, MI 494229000
United States

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address
PI/PD NAME **Herbert L Dershem**	**PhD**	**1969**	**616-395-7508**	**dershem@cs.hope.edu.**
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				

Electronic Signature

CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in Grant Proposal Guide (GPG), NSF 04-23. Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of Grant Policy Manual Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Drug Free Work Place Certification

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Appendix C of the Grant Proposal Guide.

Debarment and Suspension Certification

(If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency? Yes ☐ No ☒

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Appendix D of the Grant Proposal Guide.

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, ''Disclosure of Lobbying Activities,'' in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Tracey Nally**	**Electronic Signature**	**Feb 16 2007 3:26PM**

TELEPHONE NUMBER	ELECTRONIC MAIL ADDRESS	FAX NUMBER
616-395-7190	**Nally@hope.edu**	**616-395-7923**

*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD. HOWEVER, THEY ARE AN INTEGRAL PART OF THE INFORMATION SYSTEM AND ASSIST IN PROCESSING THE PROPOSAL. SSN SOLICITED UNDER NSF ACT OF 1950, AS AMENDED.

NATIONAL SCIENCE FOUNDATION
Division of Undergraduate Education

NSF FORM 1295: PROJECT DATA FORM

The instructions and codes to be used in completing this form are provided in Appendix II.

1. **Program-track** to which the Proposal is submitted: **S-STEM:SCHLR SCI TECH ENG&MATH**
2. Name of **Principal Investigator/Project Director** (as shown on the Cover Sheet):
   Dershem, Herbert
3. Name of submitting **Institution** (as shown on Cover Sheet):
   Hope College
4. **Other Institutions** involved in the project's operation:

Project Data:

A. Major Discipline Code: **99**
B. Academic Focus Level of Project: **UP**
C. Highest Degree Code: **B**
D. Category Code: ___
E. Business/Industry Participation Code: **NA**
F. Audience Code: _ _ _ _ _ _ _ _
G. Institution Code: **PRIV**
H. Strategic Area Code: _____
I. Project Features: _ _ _ _ _

Estimated number in each of the following categories to be directly affected by the activities of the project during its operation:

J. Undergraduate Students: **24**
K. Pre-college Students: **0**
L. College Faculty: **14**
M. Pre-college Teachers: **0**
N. Graduate Students: **0**

Project Summary

This project provides scholarships for students with financial need who transfer to Hope College from a community college to major in biology, chemistry, computer science, engineering, geological and environmental sciences, mathematics, or physics. The scholarships of $10,000 per year are offered to eight transferring students each year over three years. The scholarships are renewable for a second year if the student meets eligibility requirements.

The objectives of this project are to (1) improve the collaboration between local community colleges and Hope College STEM programs; (2) recruit to Hope College STEM students at community colleges who would not ordinarily consider attending Hope; (3) increase the number of community college students who transfer into STEM programs at Hope College; and (4) increase the retention of community college transfers in STEM disciplines at Hope.

This project will identify and recruit students on six community college campuses in Hope's geographic region. Scholarship recipients will be selected after personal interviews and review of their college admissions packets. Selection is based on promise for academic success and potential for the scholarship to affect career choice.

Each student supported by these scholarships will be given the opportunity to participate in a summer research project at Hope College in the summer before they begin studies at Hope. They will also be supported in their study at Hope by intensive faculty advising, timely and appropriate academic assistance, peer mentoring, career counseling and education, internship and research opportunities, and a program for building community among S-STEM scholars.

Intellectual Merit: This project will build upon the nationally recognized Hope STEM programs, the current Hope CSEMS program, and the college's extensive infrastructure for student support to enable 24 students to transfer to Hope and pursue degrees in one of the STEM disciplines.

Broader Impacts: This project especially targets community college students who usually do not consider attending a private liberal arts college like Hope, thus increasing economic and racial diversity in STEM fields.

TABLE OF CONTENTS

For font size and page formatting specifications, see GPG section II.C.

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

Project Description

a. Results from Prior NSF Support

Hope College is currently receiving NSF support for a CSEMS project DUE-0422388, "CSEMS Scholarship Program in Computer Science, Engineering, and Mathematics." The PI of the proposed S-STEM project is also the PI of the CSEMS project. The CSEMS project, in its third year of four, is supporting 32 undergraduate students in the study of computer science, engineering, and mathematics at Hope College. These students have been enrolled in a focused first-year seminar and have received additional counseling and assistance through the CSEMS program. The goals of this CSEMS project are to increase the retention of students and enrollment of underrepresented groups in the CSEMS disciplines at Hope College. Preliminary assessment data for this project are included in the table below:

Start Date	N	Retention at Hope			Retention in CSEMS			Ave GPA	Female	Minority
		1 yr	2 yr	3 yr	1 yr	2 yr	3 yr			
2004	6	100%	100%	100%	83%	83%	83%	3.47	50%	17%
2005	16	94%	94%	-	100%	94%	-	3.45	25%	13%
2006	12	100%	-	-	100%	-	-	3.36	25%	8%
Total CSEMS	34	97.1%	95.5%	100%	97.1%	90.9%	83.3%	3.42	29.4%	11.8%
Institution	3203	87.7%	81.8%					3.30		4.3%

Noteworthy in the above table are the following:

- Retention at Hope of CSEMS participants significantly exceeds the overall campus retention percentage. (**100%** to **87.1%** for 1 year and **94%** to **81.8%** for 2)
- Although there is no control data for retention in CSEMS disciplines, the percentages above represent only two students who left the CSEMS disciplines. Both of these transferred to other STEM disciplines.
- Although CSEMS recipients are not selected for academic excellence and their course work is more demanding than typical Hope students, their GPAs exceed the institutional average. (**3.42** to **3.30**)
- While the percentage of females in CSEMS is about half of the institution's, it exceeds the overall average in the CSEM disciplines. (**29.4%** to **22.8%**)
- The percentage of CSEMS students from minority groups greatly exceeds the institutional percentage. (**11.8%** to **4.3%**)

All of these preliminary figures point to success in meeting the goals of the CSEMS project.

The ongoing CSEMS project differs from the proposed project in several ways. While the CSEMS project focuses on incoming first-year students, the S-STEM project will focus on students transferring as third-year students from community colleges. The proposed project also includes all of the Science, Technology, Engineering, and Mathematics (STEM) disciplines at Hope rather than only computer science, engineering, and mathematics. By recruiting community college transfer students, this S-STEM project will enable Hope College to provide quality education in the STEM disciplines to students who do not currently benefit from it. The two projects will be connected by upper level CSEMS students mentoring the arriving S-STEM students.

b. Project Objectives and Plans

The objectives of the proposed project are:

1. To improve the interface between local community colleges and Hope College STEM programs.
2. To generate applications to Hope College from community college students who intend to major in a STEM discipline and who would not ordinarily consider attending Hope College.
3. To increase the number of community college students who transfer into STEM programs at Hope College.
4. To increase the number of community college transfer students who graduate from Hope College with a major in a STEM discipline.

Program Plan

In 2006, Hope College established formal relationships with six Michigan community colleges by constructing documents listing courses at each community college that prepare students to transfer into each STEM program at Hope College. This project will provide for the identification and recruitment of qualified community college students from these six community colleges in order that they might pursue degrees in science, engineering, or mathematics at Hope. This will include assisting students in choosing the appropriate courses at their community colleges to prepare them for a smooth transition to the corresponding Hope College STEM program through the documents described above and appropriate advising.

Once the students are enrolled at Hope College, the S-STEM program will both provide financial support and facilitate success through the establishment of a cohort group of S-STEM scholars, guaranteed research opportunities, faculty and student mentoring, and enhanced academic advising. These activities will not only seek to ensure academic success to graduation, but also to assist the S-STEM scholarship recipients in preparation for post-graduation employment and graduate studies.

Program activities

All S-STEM scholarship recipients will participate in project activities with the purpose of facilitating the transition to a four-year college environment and increasing retention of these students in one of the target disciplines. These activities will include undergraduate research, faculty advising, academic assistance, peer and faculty mentoring, community-building events, information about research and internship opportunities, and career planning seminars.

c. Significance of Project and Rationale

How this project supports the goals of S-STEM

1. Improved educational opportunities for students.

Community college students rarely consider continuing their studies in science, engineering, or mathematics at a four-year private liberal arts college like Hope because of the expense of such institutions. For this reason, such students are unable to take advantage of many of the documented benefits of such colleges, including undergraduate research and the overall success of such institutions in preparing leaders in the STEM

fields. See Section h of this proposal for a description of some specific benefits at Hope College. This project will provide financial assistance to transferring community college students to allow them to consider pursuing a degree in science, engineering, or mathematics at Hope College. This financial assistance and the project recruiting activities will encourage students who might not otherwise consider pursuing STEM disciplines in a liberal arts environment to do so.

2. *Increased retention of students to degree achievement.*

The financial incentive, the opportunity to participate in undergraduate research, the close faculty-student working relationships at Hope, and the activities included in the Hope College S-STEM program are designed to improve retention in the Hope degree program and the STEM disciplines.

3. *Improved student support programs at institutions of higher education.*

The cohort group development, faculty advising, and peer and faculty mentoring activities of this project will build upon and improve present support activities for Hope College students, especially students with the special qualifications required of S-STEM scholars. In addition, Hope College's support services for all transferring students, including articulation, will be improved by procedures implemented through the S-STEM program.

4. *Increased numbers of well educated and skilled employees in technical areas of national need.*

This project will meet this objective by creating programs to support and encourage at least 24 students to successfully prepare for careers in science, engineering, or mathematics. It will also develop an infrastructure that will support and encourage an increase in the number of students entering these disciplines in the future. This infrastructure will accomplish this by strengthening the linkages through which the pool of student talent at community colleges gains access to continued study at a four-year, liberal arts institution.

Information on Demographics

The most recent retention data for the general student population at Hope College indicates the following rates at the end of each year:

Hope College Retention Rates ending 2006					
At end of Year 1	**At End of Year 2**	**At End of Year 3**	**At End of Year 4**	**At End of Year 5**	**At End of Year 6**
87.7%	82.4%	79.8%	75.7%	76.1%	76.3%

We expect that with the special services provided to S-STEM scholars, the retention rate of this group will meet or exceed the percentages above.

The number of graduating seniors for each of the participating departments over the past five years is given in the following table:

Graduating Majors by Year							
Department	**2001**	**2002**	**2003**	**2004**	**2005**	**Ave.**	**% female**
Biology	53	56	50	26	34	43.8	58.8%
Chemistry	31	36	42	27	32	33.6	46.9%

Computer Science	16	16	18	14	9	14.6	12.3%
Engineering	10	9	11	8	5	8.6	23.3%
Geology & Environmental sciences	9	7	5	5	2	7.0	42.9%
Mathematics	10	7	12	15	11	11.0	36.4%
Physics	5	1	4	3	4	3.4	35.3%

Students graduating from Hope College who transfer from community colleges are shown in the Table below:

Year	**Graduating Students**	**Graduating Students who are CC transfers**		**Graduating Students who are CC transfers & STEM major**	
2002	706	6	0.8%	1	0.1%
2003	809	14	1.7%	2	0.2%
2004	751	15	2.0%	1	0.1%
2005	647	20	3.1%	2	0.3%

The above table shows that the number of Hope College graduates who transfer from community colleges is very low. Furthermore, only one or two of these each year complete majors in one of the STEM disciplines. Although we have no supporting data, we believe that this is due in large degree to the expense of attending Hope in comparison with state institutions. This belief is corroborated by counselors at the six target community colleges with whom we have consulted in the preparation of this proposal.

Hope College financial aid data indicate that 60% of entering first-year Hope students have financial need at the level required for S-STEM scholarship recipients. Although corresponding data are not available for transferring community college students, we believe that such students require aid at a higher rate. In addition, many forms of financial aid that are targeted to incoming first-year students at Hope are not available to transfer students. This includes all merit-based scholarships.

Rationale for number of scholarships and scholarship amount

We propose funding eight incoming students per year each year of the project for the amount of unmet need up to a maximum of $10,000. This will maximize the effectiveness of this project as an incentive to targeted community college students and allow Hope College to establish a strong connection with our partner community colleges. The successful completion of a Hope degree in a STEM discipline by all of the S-STEM recipients will result in a 40% increase in the number of Hope College graduates who transfer from a community college and more than a 4-fold increase in the number graduating with a major in a STEM discipline. While this represents a dramatic percentage increase, discussions with representatives of local community colleges indicate this is not an unreasonable expectation.

The plan for awarding the scholarships is given below:

	2007-8 Year 1	2008-9 Year 2	2009-10 Year 3	2010-11 Year 4	2011-12 Year 5
Incoming student scholarships	0	8	8	8	0
Second-year student scholarships	0	0	8	8	8
Total scholarships awarded	0	8	16	16	8

This plan is based on the assumption that there will be no attrition among the scholarship recipients. Any scholarship funds made available through attrition will be distributed as described in Section e under the heading *Eligibility and Replacement Process*.

d. Activities on Which the Current Project Builds

Undergraduate Research: All Hope STEM departments have had long-established undergraduate research programs, including support from the NSF_REU program. In the summer of 2006, more than 170 undergraduate students participated in scientific research on the Hope campus. These undergraduate research programs have been effective tools in the recruitment and retention of talented students to Hope College, but have not traditionally included community college students. All S-STEM scholarship recipients will be offered a summer undergraduate research position in their discipline in the summer before they begin their study at Hope.

CSEMS Project: In the fall of 2006, there were 32 Hope College students who were supported by the NSF CSEMS scholarship program. Of this group, 5 will graduate in 2008, 15 in 2009, and 12 in 2010. These CSEMS students will serve as peer mentors for the S-STEM scholars when they arrive on the Hope College campus. In addition, activities will be scheduled that will combine the two groups of scholarship recipients.

Hope College participation in NSF Undergraduate Research Centers program with Harold Washington College: The chemistry department at Hope College invites four to five students from Harold Washington College in Chicago to participate in their summer research program. Their participation is a part of the NSF-URC program at Harold Washington. This serves as a model for the proposed participation of the S-STEM students in research across all of the STEM disciplines.

Academic Support Center: The Hope College Academic Support Center assists students in the transition to college and helps them improve their study habits, learning skills, and class performance. It provides its services to all Hope students, individually or in small groups. These services include individual peer tutoring at all levels, small group help sessions, workshops, academic counseling, and a mathematics and statistics lab. S-STEM scholars will learn about the Academic Support Center during their orientation and will be encouraged by the PI and their advisors to utilize the services of the Office as appropriate. The PI will work with the Academic Support Center to develop new initiatives to meet the needs of transfer students.

e. S-STEM Project Management Plan

<u>Personnel</u>

The ongoing operation and management of this program will be the responsibility of the Project Leadership Team. This team will be chaired by the PI, Herbert Dershem, who is Professor of Computer Science. Professor Dershem served as chair of the Hope College Computer Science Department for 28 years, directed the Hope College Computer Science NSF-REU Site program for 12 years, and has served as the PI for the Hope College CSEMS program for the past four years. He was interim Dean of the Natural Sciences at Hope College in 2005. He has also served as the admissions liaison for the Hope College Computer Science Department for the past 28 years. In that capacity, he

meets with many prospective students, their parents, and counselors each year for the purpose of recruiting these students to Hope College. During the summer of 2006, the PI visited each of the six partnering community college campuses and in collaboration with the staff at those colleges, prepared course equivalency documents between each college and Hope. He has established strong ties between the STEM programs at these community colleges and Hope College.

The PI will be assisted in carrying out the administrative duties of this project by Bev Harper, administrative assistant to the Dean of Natural Sciences. Since Mrs. Harper's position is funded through the various projects on which she works, pay for her contributions to this project is included in the project budget.

The **Project Leadership Team** will be made up of a representative from the Dean of Natural Sciences Office and from each of the other six Hope STEM departments. Each member will serve as a liaison with their department, informing members about S-STEM activities, soliciting the assistance of departmental faculty, and coordinating S-STEM activities with department chairs. The department representatives will be: Tracey Arndt, Assistant to the Dean of Natural Sciences and Director of Federal Grant Programs, Prof. Tom Bultman, Biology, Prof. Michael Seymour, Chemistry, Prof. Herbert Dershem, Computer Science, Prof. Roger Veldman, Engineering, Prof. Brian Bodenbender, Geological and Environmental Sciences, Prof. Aaron Cinzori, Mathematics, and Prof. Paul DeYoung, Physics. It should be noted that Project Leadership Team member Professor Paul DeYoung is a graduate of both partner institution Muskegon Community College and Hope College, providing special insight into the opportunities and challenges facing the S-STEM scholars.

In addition, an **oversight committee** will implement and evaluate the S-STEM program. This committee will consist of the PI plus the following members of the Hope College community:

- Moses Lee, Dean of the Natural and Applied Sciences
- James Bekkering, Vice President for Admissions
- Phyllis Kleder Hooyman, Director of Financial Aid
- Jon Huisken, Dean for Academic Services and Registrar

The oversight committee will meet at the conclusion of each academic year to review the S-STEM program, evaluate its success in meeting its objectives, and determine adjustments that need to be made. This committee will be convened by the PI, who will be responsible for presenting a report for the committee's review at each meeting.

In addition, each of the seven STEM departments at Hope College will review the S-STEM project at one department meeting each year to assess the program from the departmental viewpoint and to recommend changes. The departmental recommendations will then go to the oversight committee for further consideration and action.

The **Project Advisory Committee** will consist of a representative from each of the six target community colleges. This committee will meet once each year and will assist the PI in evaluating the effectiveness of recruitment and community college interface efforts. The members of the Project Advisory Committee will be:

- Rick Olsen, Dean of Arts and Sciences, Grand Rapids Community College
- Tom Deits, Chair of the Science Department, Lansing Community College
- Rod Price, Physics Department, Kellogg Community College

- Deborah Dawson, Dean of Business and Advanced Technology, Kalamazoo Valley Community College,
- Tony Jenkins, Academic Chair of Science and Math, Northwestern Michigan College
- Bob Ferrentino, Vice-President for Academic Affairs, Muskegon Community College

Recruiting

Recruiting S-STEM scholars will be coordinated by the Project Leadership Team working closely with the Project Advisory Team. Recruiting efforts will focus on six community colleges that are located near Hope College and from which Hope has traditionally received the largest number of transfer students. The following community colleges are the target institutions at the present time:

- Grand Rapids Community College (Grand Rapids, MI)
- Muskegon Community College (Muskegon, MI)
- Kalamazoo Valley Community College (Kalamazoo, MI)
- Kellogg Community College (Battle Creek, MI)
- Lansing Community College (Lansing, MI)
- Northwestern Michigan College (Traverse City, MI)

Additional community colleges may be added to the target group during the course of this project. Students from other community colleges will be recruited through referral from the Hope College admissions office as these students inquire about Hope College. The Hope participation in the NSF-URC project (see Section d) will also be a potential source of additional candidates.

The PI will maintain contact with each of the target institutions through the Project Advisory Committee member, community college faculty in the STEM disciplines, and community college counselors and articulation officers to identify students who are candidates for a Hope S-STEM award. The PI will visit each campus at least once each year for recruiting purposes and will facilitate visits of other Hope College faculty and students to the community college campuses and visits of community college faculty and students to Hope College.

During the summer of 2006, the PI, in consultation with representatives from each of the six targeted community college campuses, prepared course equivalency documents for each of the community colleges in each of the STEM disciplines at Hope, as well as for the Hope general education requirements. These documents define which community college courses fulfill requirements for a Hope College degree, aiding the students in planning their community college course selections and facilitating their transition to Hope. Prior to this time, no such documents existed. The PI coordinated the production of these documents with the articulation officers of the participating community colleges, the Hope STEM department chairs, and the registrar at Hope College. These documents will be made available to the community college students through their counseling offices and institutional web sites.

Selection

Identified candidates for scholarships on each of the six community college campuses will be invited to submit applications for the Hope S-STEM scholarships. The deadline for the applications will be March 1 of each year. All candidates will be invited to the Hope campus, interviewed by the PI, and given a tour of the appropriate campus

facilities, including laboratories. In addition, each applicant will be asked to provide contact information for a community college instructor, who will be contacted as a reference by the PI. The Project Leadership team will review all of the application materials submitted by the candidates, including the candidates' applications to Hope College. The Project Leadership Team will apply the eligibility and selection criteria given in Section f to determine the recipients of the scholarships. An ordered list of qualified alternates will be maintained as a pool of recipients in the cases where successful applicants decide not to attend Hope. The target date for notification is April 1.

Applications from students who attend community colleges that are not in our target group of six will also be considered, though the project recruiting strategies will not be implemented beyond the target institutions. If there are not eight qualified community college applicants for this program in a given year, the remaining scholarships will be awarded to transfer students from four-year colleges or universities.

Record Maintenance and Reporting

The PI will be responsible for collecting all data needed for eligibility determination, assessment of the project, reporting to the Hope College oversight committee, and reporting to the National Science Foundation. He will be assisted in these efforts by administrative assistant Bev Harper, the Hope College Frost Center for Social Science Research, Registrar's Office, Admissions Office, and Financial Aid Office.

Student Support Programs Oversight

The support programs of the S-STEM project, described in Section g, will utilize services already present on the Hope campus. In many cases, Hope students who could benefit from these services fail to do so because they fail to take the initiative required, do not know a service exists, or are unaware that they could benefit from the service.

The PI will be responsible for making all S-STEM recipients aware of the support services provided by the college in conjunction with the S-STEM program. This will include the opportunity to participate in an undergraduate research project in the summer prior to the student's arrival on campus. The students will be made aware of other services during the S-STEM orientation workshop. The PI will also work with the offices providing these services to develop appropriate adaptations that meet the particular needs of the S-STEM program.

Each S-STEM recipient will have an academic advisor who is a faculty member in the student's major department. In most cases, this advisor will be a member of the Program Leadership Team. Each S-STEM scholar will meet with her or his faculty advisor monthly, either individually or as a group. These meetings will be used to assess the scholar's progress in the academic program, provide career counseling, and identify other issues that need to be addressed to facilitate the scholar's transition into the Hope College environment.

The PI will also coordinate mentoring, research, and internship activities with the seven S-STEM departments by working closely with the department chairs, each department's internship coordinator, and each department's undergraduate research coordinator.

The academic support program for S-STEM scholars will be run through the Hope College Academic Support Office. See Section d for a further description of this

office. The PI will work with the Director of Academic Support to ensure appropriate assistance is available through tutoring, academic skills building, or the formation of directed study groups. The PI will also work with the academic advisors to encourage S-STEM scholars to utilize the academic support services that are provided.

The career investigation component of the S-STEM program will be directed by the PI in partnership with Sara DeVries, the Assistant Director of Career Services at Hope College. In addition to the services provided by this office to all Hope College students, special sessions will be held exclusively for the S-STEM scholars, both during the orientation period and in each academic year.

Eligibility and Replacement Process

At the time of the selection of S-STEM scholars and at the conclusion of each semester, the PI will determine if each candidate or scholar meets the eligibility requirements as listed in Section f.

When an S-STEM scholar becomes ineligible to continue receiving the scholarship, the remaining funds for that scholar will be reallocated by action of the Project Leadership Team to one of the following:

- An S-STEM student who previously lost eligibility, but has since regained it.
- A student transferring to Hope College from a four-year college or university who meets the eligibility requirements.
- A student who is already enrolled in her third or fourth year in one of the STEM departmental programs and who meets the eligibility requirements.

Preference for replacement scholarships will be given to students who have a large amount of unmet need. These scholarships will be awarded for at least one year, but will not necessarily be for the full $10,000 nor renewed for a second year, even if eligibility requirements continue to be met. Recipients of replacement scholarships will not necessarily be given an opportunity to participate in undergraduate research.

Evaluation and Assessment

The assessment and evaluation plan described in Section i will be directed by the PI in consultation with the Hope College Frost Center for Social Science Research. In addition, the evaluations performed by the participating departments and the oversight committee will be coordinated by the PI.

Rationale for Size of Program

The Hope College STEM departments can easily support an additional eight students per year within their present infrastructure. The departments of Computer Science, Geological and Environmental sciences, Mathematics, and Physics are all operating far below their capacity for upper-level students. The other departments are also able to accommodate additional students. Eight students per year make a significant cohort group for mutual support to aid their transition to a residential, four-year campus.

Project Administration Calendar

Hope College S-STEM Project Administrative Calendar			
	Year 1	Years 2-4	Year 5
Jun – July		Incoming S-STEM scholars participate in undergraduate research	
Aug		Orientation program for incoming S-STEM scholars	
Sept	Contact community college administrators and instructors to identify candidates	Begin mentoring program Contact community college personnel to identify candidates	
Oct	Contact candidates through community college visits and invite them to Hope campus	Contact candidates through community college visits and invite them to Hope campus	
Dec		Eligibility check for S-STEM scholars.	Eligibility check
Mar	Review applications and conduct interviews with candidates	Review applications and conduct candidate interviews	
Apr	8 S-STEM scholars selected	8 S-STEM scholars selected	
May	Oversight Committee meets. Submit progress report to NSF	Eligibility check Oversight Committee meets. Submit annual report to NSF	Oversight Comm. meets. Submit final report to NSF

f. Student Selection Process and Criteria

While only the six regional community colleges will be targeted through articulation and recruitment, applications will be considered from students transferring from any community college. Community college students will be eligible for an S-STEM scholarship if they meet the following criteria:

1. The student must meet the eligibility requirements for citizenship and financial need as specified in the S-STEM guidelines.
2. The student must have a community college GPA of 3.0 or better, been accepted for admission to Hope College, and have adequate preparation to pursue a major in a STEM field at Hope College.
3. The student must have indicated an interest in pursuing a major in one of the S-STEM disciplines.

Each candidate for an S-STEM scholarship will be required to submit a statement indicating her academic and career goals and stating how the S-STEM scholarship will benefit the student in attaining those goals. Each candidate will also be required to submit the name of a community college instructor who will serve as a reference for the student. In addition, the candidate will be interviewed by the PI and one other member of the Project Leadership Team during a visit to the Hope College campus.

Students who are awarded an S-STEM Scholarship will be selected from among qualified applicants by the Project Leadership Team using the following criteria:

1. Promise of academic success.
2. Interest in an academic and professional career in one of the STEM disciplines.
3. Perceived impact the scholarship will have on the student's pursuing a major in a STEM discipline at Hope College.

Preference will be given to candidates from underrepresented groups when they meet all of the above criteria.

Scholarship Renewal

At the completion of each semester of their academic program, recipients of the S-STEM scholarships must meet the following criteria in order to retain their scholarship for the following semester:

1. The student must maintain an overall GPA of 2.5 or better on a 4.0 scale. This level is intentionally lower than the requirement for most scholarships at Hope College to emphasize that this scholarship is not strictly awarded for academic excellence, but to encourage students at all satisfactory levels of achievement to obtain their degrees in STEM disciplines at Hope College.
2. The student must have declared a major in one of the STEM disciplines and be progressing satisfactorily toward completing that major.
3. The student must have been an active participant in S-STEM sponsored student activities during the semester just completed.

g. S-STEM Student Support Services and Programs

Undergraduate Research

All S-STEM scholars will be offered an opportunity to participate in an undergraduate research project in the summer before they begin studies at Hope. This will enable these students to become acquainted with a group of students and a faculty member in their field and to become familiar with the work done in a research lab at Hope. It will also result in a possibility that they can continue working in that lab during the academic year. S-STEM scholars will receive a stipend for their summer research participation and on-campus housing will be provided free of charge. Both of these will be consistent with what is provided to all Hope summer undergraduate researchers.

Orientation

All S-STEM scholars will be required to attend a two-day orientation session prior to their enrollment at Hope College. At this session, the scholars will become acquainted with Hope College and its facilities. They will meet with their faculty advisors and peer mentors and learn about many of the support services listed below. This will include an introduction to the Offices of Career Planning and Placement, Academic Support, Multicultural Life, Registrar, and Residential Life.

Student Housing

The PI will work with the Hope College Housing Office to house, whenever possible, the incoming S-STEM scholars in the same Hope College residence hall during

their first year. This will help to establish a spirit of community among the S-STEM scholars.

Faculty Advising

Each S-STEM scholar will have a faculty advisor, who is a member of one of the STEM departments, usually a member of the Project Leadership Team. In addition, the PI will contact each S-STEM scholar monthly to assess the student's progress. Through these contacts, the PI will monitor the students' academic progress, successful integration into the four-year college environment, and progress in career planning.

Academic Assistance

The Hope College Academic Support Center provides tutoring in specific courses and assistance with a variety of academic skills. All S-STEM scholars will tour the Academic Support Center during their orientation and be advised of the services it provides. The faculty advisors will refer the S-STEM scholars to the Center as appropriate. In addition, the PI will encourage the formation of S-STEM study groups in courses where such groups will be helpful.

Peer Mentoring

Each S-STEM scholar will be paired with a student who is a participant in the ongoing Hope College CSEMS programs. These mentors will be students majoring in computer science, engineering, or mathematics in their third or fourth year at Hope. During the orientation workshop, an event will be held where S-STEM scholars and their peer mentors will have an opportunity to interact. After that, the pairs will be encouraged to meet as often as is useful.

Career Services

The S-STEM scholars will be introduced to the resources of the Hope College Career Services Office during their orientation. These resources are useful for the choice of career and for assisting students in the process of finding a job upon graduation. A career planning session will be held each year for the S-STEM scholars. In addition, local graduates of Hope College with majors in STEM disciplines will be asked to informally mentor S-STEM scholars during their time at Hope.

Internships

Most of the Hope College STEM departments have an active internship program. S-STEM scholars will be introduced to the procedures for obtaining internships during their orientation and encouraged to pursue opportunities for both summer and school year internships. Organizations that regularly provide internship opportunities for Hope students will be informed of the S-STEM program and its objectives.

Community Building

A minimum of two activities will be scheduled each year that will include all S-STEM scholars, with the objective being to build community among the scholars. These events will alternate between social events and informational sessions, with the emphasis being on informality and enthusiastic participation. When appropriate, students

and faculty from the target community colleges will be invited to attend these events as well. At least one of these events each year will include the Hope College CSEMS scholars as well.

h. Quality Educational Programs

This S-STEM project links community college students to the high quality educational STEM programs at Hope College. As demonstrated below, it provides an enhanced opportunity for community college students to succeed in obtaining advanced degrees and reaching the highest level of achievement in their chosen fields.

The Division of Natural and Applied Sciences at Hope includes the departments of Biology, Chemistry, Computer Science, Engineering, Geological & Environmental Sciences, Mathematics, Nursing, and Physics and totals over 60 FTE faculty members. Hope College has a long-standing commitment to provide students opportunities to learn cutting-edge science in coherent and rigorous laboratory courses that stress hands-on, research-based modes of learning, and to work in an interdisciplinary and collaborative manner with faculty in research. The Division is recognized by Project Kaleidoscope as a whole "Program that Works" and as a model for other institutions, and Hope is one of only 10 liberal arts institutions to be recognized by the NSF with an Award for the Integration of Research and Education. Additionally, the undergraduate research program at Hope has been identified in *U.S. News & World Report* as among the leading programs in the nation (ranked 4th among all institutions in 2003).

The mission of the program in science and mathematics at Hope mirrors that of the college to provide an **innovative curriculum**, which intertwines **student learning** and **faculty development**. We operate on the principle that undergraduate research is an essential component of good teaching and effective learning. The collegial culture within the Division of Natural and Applied Sciences is the key ingredient in sustaining an intellectually vital learning community for faculty and students. In the past five years, Hope science faculty and administrators received awards totaling greater than $2,400,000 annually in new resources from extramural sources to support research, education, and outreach programs. Included among current awards are 3 separate NSF-REU site awards to support undergraduate research with another one pending.

We seek to identify and sustain students who have a diversity of ethnic backgrounds. To assist us in this regard we have formed a unique partnership with the University of Michigan to cooperatively recruit students of color for fully-supported undergraduate education at Hope College followed by fully-supported graduate and/or medical education at the University of Michigan. This highly successful program, along with outreach programs to K-12 students representing traditionally underrepresented groups in science and mathematics, work together to assist us in our goal to provide opportunities for science/mathematics education to all individuals. A new outreach program to underrepresented students in local high schools is called REACH (Research Experiences Across Cultures at Hope). This program, funded internally, invites up to two teachers and six students from local high schools to participate in Hope College summer research projects along with undergraduates and professors.

An unusually high number of students (~40%) enter Hope with an interest in science and mathematics. During their time at Hope these students are integrated into a supportive community of learners in an environment rich in research-based learning

opportunities. On the average, each summer over 120 students do research with faculty, supported in part by separate NSF-REU site awards. Although we do not have a research requirement, ~85% of Hope science and mathematics majors do research. Approximately 33% of Hope seniors graduate with a degree in science or mathematics. Of these, ~30% enter graduate school. About 35% of our science and mathematics graduates seek to enter professional school. The 10-year acceptance rate for these students is 71%, and it is 90% for students who engage in research while at Hope. The remaining students enter the workforce directly upon graduation, with many entering the teaching profession as K-12 educators.

Faculty and students sustain vitality by engaging in research. Hope College faculty rank 4th of all liberal arts institutions for numbers of faculty research publications and 14th overall for highest impact of those publications as measured by the Science Citation Index. Since 1990 over 300 undergraduate students have co-authored research publications with faculty.

i. Assessment and Evaluation

Formative Assessment.

The following will be used for formative assessment during the project. All data will be used for evaluation purposes by the oversight committee, which will meet at the end of each academic year to evaluate assessment data and recommend adjustments to the program.

1. *Tracking data for S-STEM participants.*
   Data collected will include progress toward degree, academic performance, participation in internship and research, retention in the major, graduation rate, job placement, and percentage of minorities and females. The data for S-STEM participants will be compared to results prior to S-STEM support and to the results for non-S-STEM supported majors in STEM disciplines during the period of this project. We will also track the change in the number and source of transfers to Hope College during the years of the S-STEM program.
2. *Annual survey of all participants.*
   All participants in this program (students, Project Leadership Team members, and faculty advisors) will be surveyed annually to determine the impact of the program. Student participants will also be surveyed prior to their arrival on the Hope campus.
3. *Exit survey.*
   All participants, when exiting the program, will be asked to complete a survey. There will be separate surveys for students who depart the program prior to graduating and for those who graduate as S-STEM scholars.
4. *Applications from students at targeted community colleges.*
   The number of applications to Hope College from students at the targeted community colleges will be collected each year and compared with counts from years prior to the S-STEM program.

Summative Assessment

The objectives of this project are listed below along with the assessment data that will be used to evaluate each one.

1. *To improve the interface between local community colleges and Hope College STEM programs.*

This will be evaluated by the number of applications for admission to Hope received from the students at the targeted community colleges. In addition, counselors at the community colleges will be interviewed at the completion of the project.

2. *To generate applications to Hope College from community college students who intend to major in a STEM discipline and who would not ordinarily consider attending Hope College.*

Applications to Hope College from community college students will be tabulated during and after the project and compared with corresponding data in years prior to the project.

3. *To increase the number of community college students who transfer into STEM programs at Hope College.*

All transfer students in STEM disciplines will be counted and compared with data collected in years prior to the project.

4. *To increase the number of community college transfer students who graduate from Hope College with a major in a STEM discipline.*

Retention and graduation data will be collected during and after the project and compared with similar data from before the project.

All data collection and survey design will be coordinated by the PI in consultation with the Hope College Frost Center for Social Science Research. Similar instruments already exist for the assessment and evaluation of the Hope College CSEMS program and these will be adapted for use in the S-STEM program.

Results of this program will be disseminated through the construction of a project web page. This web page will contain complete information about the project, including all assessment data. The availability of this web page will be announced through the web pages of all of the participating departments and the web page of the Hope College Natural and Applied Sciences Division.

Summary

This project will provide an effective way to attract to and retain in the STEM programs at Hope College a group of students who would not ordinarily consider attending Hope. These students will have an opportunity to benefit from the strong Hope College STEM programs. As a result of this project, pipelines will be established between the community colleges and Hope College that will benefit all institutions beyond this project's time frame. In addition, all students and faculty at Hope College will benefit from the resulting increase in student diversity.

Biographical Sketches

Principal Investigator: Herbert L. Dershem

(i) Professional Preparation

B.S. University of Dayton, 1965
M.S. (Computer Science) Purdue University, 1967
Ph.D. (Computer Science) Purdue University, 1969

(ii) Appointments

Hope College, Assistant Professor, 1969-1974, Associate Professor, 1974-1981, Professor, 1981-present, Chair, Computer Science Dept, 1976-2003, Interim Dean for Natural Science, 2005.
Oak Ridge National Laboratories, Visiting Research Scientist, 1977-1978
Boston University Overseas Program, Visiting Professor, 1982-1983
United States Air Force Academy, Distinguished Visiting Professor, 1993-1994

(iii) Publications

Up to 5 publications most closely related to the proposed project:

Dershem, H.L., McFall, R.L., and N. Uti*, "A Linked List Prototype for the Visual Represenation of Abstract Data Types," *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, 4,2(Oct, 2002).

Dershem, H.L., McFall, R.L., and N. Uti*, "Animation of Java Linked Lists," *SIGCSE Bulletin*, 34,1(Mar, 2001), 53-57.

Dershem, H.L., Dykstra*, J., and K. Suppes*, "An Abstract Window Toolkit Visualizer for Computer Science Instruction," *Proceedings of the 33rd Midwest Instruction and Computing Symposium (CD-ROM)*, April 14-15, 2000, Minneapolis, MN.

Dershem, H.L., Parker*, D.E., and R. Weinhold*, "A Java Function Visualizer," *Journal of Computing in Small Colleges*, 15,1(Oct, 1999), 221-230.

Dershem, H.L. and J. Vanderhyde*, "Java Class Visualization for Teaching Object-Oriented Concepts," *SIGCSE Bulletin*, 30,1(Mar, 1998), 53-57.

Up to 5 other significant publications, whether or not related to the proposed project:

Dershem, H.L. and P. Brummund*, "Tools for Web-Based Sorting Animation," *SIGCSE Bulletin*, 30,1(Mar, 1998), 222-226.

Dershem, H.L., Barth*, W., Bowsher*, C., and D. Brown*, "Data Structures with Ada Packages, Laboratories, and Animations," *Proceedings of the First Australasian Conference on Computer Science Education*, July, 1996, 32-38.

Dershem, H.L. and M.J. Jipping, *Programming Languages: Models and Structures: Second Edition*, PWS Publishing Co., 1995.

McFall*, R. and Dershem, "Finite State Machine Simulation in an Introductory Lab," *SIGCSE Bulletin*, 26,1(Mar 1994), 126-140.

(iv) Synergistic Activities

a. Previous grants awarded:

Co-director, "Introduction of the Computer in the Statistics Curriculum", NSF Office of Computing Activities, 1971-1973, $45,800.

Director, "A Modular Approach to the Introductory Course in Computer Science", NSF Local Course Improvement Program, 1978-1980, $14,200

Co-Director, "A Microcomputer Laboratory for use in Teaching Statistics", NSF Instructional Scientific Equipment Program, 1979-1980, 10,315.

Director, "CSNET Membership in Support of Computer Science Research", NSF RUI Program, 1987-1990, $9,375.

Director, “Computer Science Undergraduate Research Program”, NSF REU Program,1992-1994, $86,550; 1995-1997, $114,393; 1998-2000, $146,700; 2001-2003, $163,213, 2004-2008, $352,000.
Director, “Use of Ada, Laboratories, and Visualization in the Teaching of Data Structures and Discrete Mathematics”, DARPA Curriculum Development Grant, 1993- 1994, $23,010.
Director, “Curriculum and Textbook Development Using Ada 9X for the Teaching of Object-Oriented Concepts”, US Air Force Contract, 1995-1996, $34,464.
Co-Director, “An Integrated Classroom/Laboratory for Introducing Students to Object Oriented Concepts”, NSF ILI Program, 1996-1998, $46,356.
Director, “Computer Science, Engineering, and Mathematics Scholarship Program”, NSF CSEMS Program, 2005-2008, $398,040.

b. Councilor for the Council on Undergraduate Research:
Councilor, Division of Mathematics and Computer Science, 1994-2000, 2003-present.
Member of consultants committee, 1996-present.
Leader at CUR Proposal Writing Institute, 2002.

c. Member of panels related to undergraduate research:
Dershem, H., with Engel G., McFall*, R., Lopez, A., and S. Wiltz*. "Research Experiences for Undergraduates," Twenty-fourth SIGCSE Technical Symposium on Computer Science Education, Indianapolis, IN, March, 1993.
Dershem, H., with Bard, G., and D. Berque. "Finding and Developing Research Experiences for Undergraduates in the Small College Setting," Third Annual CCSC Midwestern Conference, Greencastle, IN, October, 1996.
Dershem, H., with Sanders, D., Eller-Meshreki, R., and G. Pitts. "Undergraduate Research - Welcome to the 21st Century," Twenty-eighth SIGCSE Technical Symposium on Computer Science Education, San Jose, CA, February, 1997.
Dershem, H., with Hedges, H. "Birds of a Feather Session on NSF-REU Program for Computer Science," Twenty-ninth SIGCSE Technical Symposium on Computer Science Education, Atlanta, GA, March, 1998.
Dershem, H. with McGuffee, J., Lankewicz, L., Lewandowski, G., Lopez, D., and O. Slotterbeck. “Managing Undergraduate CS Research,” Thirty-third SIGCSE Technical Symposium on Computer Science Education, Cincinnati, KY, 2002.

(v) Collaborations and Other Affiliations

a. Collaborators and Co-Editors
A list of scientists collaborated with on projects over the last 48 months would include:
Scott Grissom (Grand Valley State University), Michael Jipping (Hope College), Ryan McFall (Hope College), Myles McNally (Alma College), Thomas Naps (University of Wisconsin-Oshkosh), Samuel Rebelsky (Grinnell College), Henry Walker (Grinnell College).

b. Graduate and Postdoctoral Advisors
Robert E. Lynch (Purdue University)

c. Thesis Advisor and Postgraduate-Scholar Sponsor
None

SUMMARY PROPOSAL BUDGET YEAR 1

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	**0.00**	**0.00**	**0.50**	$ **4,500**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.50**	**4,500**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**1**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**3,000**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**7,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**7,500**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**500**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **13,120**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**8**) TOTAL PARTICIPANT COSTS				**13,120**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**500**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**1,000**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**22,120**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**22,120**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **22,120**	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET YEAR 2

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	**0.00**	**0.00**	**0.50**	$ **4,500**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.50**	**4,500**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**1**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**3,000**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**7,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**7,500**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**500**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **93,120**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**8**) TOTAL PARTICIPANT COSTS				**93,120**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**500**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**1,000**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**102,120**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**102,120**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **102,120**	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET YEAR 3

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	**0.00**	**0.00**	**0.50**	$ **4,500**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.50**	**4,500**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**1**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**3,000**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**7,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**7,500**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**500**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **173,120**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**16**) TOTAL PARTICIPANT COSTS				**173,120**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**500**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**1,000**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**182,120**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**182,120**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **182,120**	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

YEAR 4

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	**0.00**	**0.00**	**0.50**	$ **4,500**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.50**	**4,500**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**1**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**3,000**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**7,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**7,500**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**500**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **160,000**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**16**) TOTAL PARTICIPANT COSTS				**160,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**500**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**1,000**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**169,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**169,000**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **169,000**	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET YEAR 5

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	**0.00**	**0.00**	**0.50**	$ **4,500**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.50**	**4,500**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**1**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**3,000**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**7,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**7,500**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**500**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **80,000**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**8**) TOTAL PARTICIPANT COSTS				**80,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**500**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**1,000**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**89,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**89,000**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **89,000**	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

Cumulative

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Hope College**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Herbert L Dershem**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1. **Herbert L Dershem - PI**	0.00	0.00	2.50	$ 22,500	$
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0	
7. (1) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	2.50	22,500	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (0) POST DOCTORAL ASSOCIATES	0.00	0.00	0.00	0	
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0	
3. (0) GRADUATE STUDENTS				0	
4. (0) UNDERGRADUATE STUDENTS				0	
5. (5) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				15,000	
6. (0) OTHER				0	
TOTAL SALARIES AND WAGES (A + B)				37,500	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				0	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				37,500	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				2,500	
2. FOREIGN				0	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 519,360					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (56) TOTAL PARTICIPANT COSTS				519,360	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				2,500	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				0	
3. CONSULTANT SERVICES				2,500	
4. COMPUTER SERVICES				0	
5. SUBAWARDS				0	
6. OTHER				0	
TOTAL OTHER DIRECT COSTS				5,000	
H. TOTAL DIRECT COSTS (A THROUGH G)				564,360	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				0	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				564,360	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 564,360	$

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Herbert L Dershem**

ORG. REP. NAME*: **Tracey Nally**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

Budget Justification

Scholarships: The budget is calculated based on eight new fully-funded participants each year for three years. It is anticipated that students will receive the maximum stipend of $10,000 for two years. If a student's financial need is less than $10,000, the amount of the need will awarded. The total amount requested is 480,000. The requested amount is included on line **F1, Student Support Costs**.

Program Administration: The **PI** is supported for one-half month each summer for the amount of $4,500 per year. This is support for coordination with the community college campuses and preparation of reports. This is budgeted under category **A1, Senior Personnel**.

The **secretarial support** of $3,000 per year will be paid to Bev Harper, administrative assistant to the Dean of Natural Science, for her services in assisting the PI with the administration of this project. This is budgeted under category **B5, Secretarial - Clerical**.

Project assessment and evaluation will be carried out by the Frost Center for Social Science Research at Hope College. This supported is budgeted at $500 per year under the category **G3**, **Consultant Services**.

Travel costs are to support faculty and student travel between the community college campuses and Hope College for the purposes of recruitment and advisory team meetings. This is requested on line **E1, Travel** at a rate of $500 per year.

Supplies to support the orientation program and recruiting of students are budgeted at $500 per year under category **G1, Material and Supplies**.

The total Program Administration cost is $45,000 which is 7.97% of the total project budget of $564,360.

Student Support Costs: An amount of $1,640 is budgeted for each student to partially support their summer research experience. The requested amount in this proposal is included on line **F1, Student Support Costs**.

The total Student Support cost is $39,360 which is 6.97% of the total project budget of $564,360.

Hope College Contribution: Hope College is committed to paying the remainder of the stipend and other costs of all S-STEM students who participate in summer research. It is estimated that the cost of summer research is $4,000 per student, so Hope College will provide an additional $2,360 per student. If all S-STEM students participate in summer undergraduate research, this will amount to a college contribution of $56,640. In addition, Hope College pays the housing costs for all summer undergraduate research participants.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Herbert Dershem	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Scholarships for Transfer Students in Science, Engineering, and Mathematics

Source of Support: National Science Foundation - S-STEM

Total Award Amount: $ 564,360 Total Award Period Covered: 09/01/07 - 08/31/12

Location of Project: Hope College

Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.00 Sumr: 2.50

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: CSEMS Scholarship Program in Computer Science, Engineering, and Mathematics at Hope College

Source of Support: National Science Foundation - CSEMS

Total Award Amount: $ 398,040 Total Award Period Covered: 08/01/04 - 07/31/08

Location of Project: Hope College, Holland, Michigan

Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.00 Sumr: 0.50

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Muskegon Community College
221 South Quarterline Road • Muskegon, Michigan 49442
Academic Affairs Office • (231) 777-0254

February 8, 2007

Dr. Herbert L. Dershem
Hope College
35 E. 12th Street
Holland, MI 49423-9000

Dear Dr. Dershem:

On behalf of Muskegon Community College, I offer this letter of support for the National Science Foundation grant in support of the S-STEM proposal.

The S-STEM proposal represents an excellent opportunity for the students at Muskegon Community College (MCC). As indicated in the grant proposal, MCC students in science, technology, engineering, and mathematics often thrive in educational environments that include small classes, significant educational support and occasional intervention to help them assess their progress. Hope College, particularly under the conditions outlined in the S-STEM proposal, offers an excellent environment for our community college students to continue their success in areas that are critical to the economic health of the State of Michigan. I confirm the dilemma presented in the project proposal. Economic barriers are a likely factor in preventing some of our best students from participating in the excellent learning environments embodied by Hope College. The availability of $10,000 scholarships, combined with excellent support by Hope College faculty and staff, should attract and retain significantly more MCC students.

Muskegon Community College welcomes the opportunity for our students and enthusiastically supports the goals of the S-STEM proposal. We believe the processes outlined in the grant proposal will result in a high probability of success for MCC students should they chose to attend Hope College under the S-Stem proposal. Success in the STEM areas will benefit not only the students, but also Hope College and the State of Michigan. Thank you for the opportunity this proposal represents for our students.

Sincerely,

Robert C. Ferrentino
Vice President for Academic Affairs
Muskegon Community College

LANSING COMMUNITY COLLEGE
Where Success Begins

5400 Science Department
Lansing Community College
P. O. Box 40010
Lansing, Michigan 48901-7210
Phone: (517) 483-1085 Fax: (517) 483-1003

February 2, 2007

Mr. Herbert L. Dershem, Ph.D.
Interim Chair for natural Science
Hope College
35 E 12th St
Holland MI 49423

Prof. Dershem:

I am pleased to offer my support for the NSF Division of Undergraduate Education proposal entitled "Scholarships for Transfer Students in Science, Engineering and Mathematics."

I will be happy to serve as the advisory board member for Lansing Community College as envisaged in this project.

LCC will work with Hope College to improve our articulation of courses between our institutions; Sophie Jeffries, our interim Director of Instruction in the Liberal Studies Division, will provide valuable articulation expertise in this process.

LCC has a long experience in articulation with 4-year colleges and in supporting our students' transitional experiences. An excellent example of this commitment is the new LCC University Center, currently under construction, which will support, on the LCC campus, course offerings at the undergraduate and graduate level from a number of 4-year colleges from across Michigan.

In addition, the Science Department has been actively involved in easing this transition through a number of innovative programs. One example is the recently completed articulation agreement with Central Michigan University which will allow LCC students to smoothly transition to a CMU baccalaureate curriculum in elementary education with a science emphasis. This program will allow LCC students to complete all degree requirements through coursework and internships at LCC and in the Lansing area.

Lansing Community College is a large (serving approximately 20,000 students) and highly diverse urban community college. As such, we believe that this is fertile ground for identification of worthy scholarship candidates who will greatly benefit from the opportunities that this program represents.

We look forward to working with you to make this project a success.

Best wishes,

Thomas L. Deits
Chairperson, Science Department

Northwestern Michigan College

February 7, 2007

To Whom It May Concern:

The Science and Mathematics Academic Area of Northwestern Michigan College in Traverse City, MI, endorses the NSF grant proposal submitted by Herbert Dershem of Hope College which provides scholarships for community college students transferring to Hope College for degrees in science or mathematics.

The Science and Mathematics Academic Area at NMC is proud of the success our students have enjoyed at their transfer institutions. The vast majority of our students in the past, due to financial constraints, have transferred to public, state supported universities to complete their education. Schools like Michigan State and Michigan Tech are outstanding institutions; the scholarship money that this grant provides would allow our transfer students to also consider Hope as a viable option. The intimacy of a small college like Hope, its excellent academic reputation, and the ability to do undergraduate research will likely appeal to a number of our students.

The faculty and staff in the Science and Math Academic Area at NMC look forward to working with representatives of Hope College upon approval of this proposal, and are excited about the opportunity these scholarships provide for our students.

Sincerely,

Tony Jenkins
Science and Mathematics Academic Area Chair
Northwestern Michigan College

Grand Rapids Community College


143 Bostwick Avenue, NE
Grand Rapids, Michigan 49503-3295
www.grcc.edu
ph: (616) 234-GRCC
fax: (616) 234-4005

February 7, 2007

Dr. Herbert L. Dershem
Hope College
35 E. 12th Street
Holland, MI 49423-9000

Dear Dr. Dershem:

On behalf of Grand Rapids Community College, I offer this letter of support for the National Science Foundation grant in support of the S-STEM proposal.

The S-STEM proposal represents an excellent opportunity for the students at Grand Rapids Community College (GRCC). As indicated in the grant proposal, GRCC students in science, technology, engineering, and mathematics often thrive in educational environments that include small classes, significant educational support and occasional intervention to help them assess their progress. Hope College, particularly under the conditions outlined in the S-STEM proposal, offers an excellent environment for our community college students to continue their success in areas that are critical to the economic health of the State of Michigan. I confirm the dilemma presented in the project proposal. Economic barriers are a likely factor in preventing some of our best students from participating in the excellent learning environments embodied by Hope College. The availability of $10,000 scholarships, combined with excellent support by Hope College faculty and staff, should attract and retain significantly more GRCC students.

Grand Rapids Community College welcomes the opportunity for our students and enthusiastically supports the goals of the S-STEM proposal. We believe the processes outlined in the grant proposal will result in a high probability of success for GRCC students should they chose to attend Hope College under the S-STEM proposal. Success in the STEM areas will benefit not only the students, but also Hope College and the State of Michigan. Thank you for the opportunity this proposal represents for our students.

Sincerely,

Richard F. Olsen, Dean
School for Arts and Sciences
Grand Rapids Community College

KELLOGG COMMUNITY COLLEGE

450 North Avenue • Battle Creek, MI 49017-3397 • (269) 965-3931

February 5, 2007

Dr. Herbert Dershem
Hope College
35 E. 12 th Street
Holland, MI 49423

Dr. Dershem,

It is my pleasure to give this letter of support for the S-STEM proposal.

Our country is currently seeing a growing decline in the number of students majoring in the mathematical and scientific fields. It is our job as educators to address this crisis and work towards a goal of improving the education that our current math, technology, engineering, and science students receive, as well as encourage new students to apply their abilities in these fields. The S-TEM project does both. Encouraging undergraduate students to take part in research opportunities within their areas of interest will certainly help these students become better learners and increase the probability of successfully completing their degrees. The scholarship opportunities and educational support from Hope faculty and staff will definitely help entice students to attend Hope College and major in STEM areas.

This proposal will provide high quality students with high quality educational opportunities which may otherwise be outside their financial reach. One of our jobs as educators is to provide our students with as many options as possible. Support of this proposal will help us do so. I believe the S-STEM project will result in an increase in Hope graduates in these areas of study. This will benefit not only Hope and it's students, but all of the surrounding area. On behalf of Kellogg Community College, I firmly support this proposal and the ideals that it represents.

Sincerely,

Rod M. Price
Instructor of Physics
Kellogg Community College

BOARD OF TRUSTEES
G Edward Haring, Ph D
President

Robert G. Grimes, Chairman
Ann Rosenbaum Petredean, Vice Chairman
Brian C. Hice, Secretary
Eugene D. Hamaker, Treasurer
Arthur W. Angood, Trustee
Judith L. Burken, Trustee
Dr. John B. Morris, Sr, Trustee

KALAMAZOO VALLEY COMMUNITY COLLEGE
A COMMUNITY OF LEARNING

Texas Township Campus
6767 West O Avenue
P.O. Box 4070
Kalamazoo, Michigan
49003-4070
P 269.488.4400
F 269.488.4553

Arcadia Commons Campus
202 North Rose Street
P.O. Box 4070
Kalamazoo, Michigan
49003-4070
P 269.373.7800
F 269.373.7892

MTEC
Michigan Technical Education Center
7107 Elm Valley Drive
P.O. Box 4070
Kalamazoo, Michigan
49003-4070
P 269.353.1253
F 269.353.1299

April 13, 2007

Dr. Herbert L. Dershem
Hope College
35 E. 12th Street
Holland, MI 49423-9000

Dear Dr. Dershem:

On behalf of Kalamazoo Valley Community College (KVCC), I offer this letter of support for the National Science Foundation grant in support of the S-STEM proposal.

The S-STEM proposal represents an excellent opportunity for students at KVCC to continue their studies at a 4 year institution. We have many programs that fill the S-STEM definition and would welcome the opportunity for our students to pursue a higher degree at Hope College. Hope College has an outstanding reputation in the Kalamazoo area, but cost is an issue. Having scholarship money available would open the door for students who may not otherwise have the opportunity to attend this type of institution. The support structure in place for monitoring student progress at Hope College is very similar to the environment here at Kalamazoo Valley. This is an important consideration for retaining community college students.

Kalamazoo Valley Community College is excited to be a part of this program and fully support the goals of the S-STEM proposal. We believe our students will be successful at Hope College and look forward to being able to offer them such an opportunity.

Sincerely,

Deborah M. Dawson

Deborah M. Dawson
Dean of Business and Advanced Technology
Kalamazoo Valley Community College

HOPE COLLEGE DEAN FOR THE NATURAL AND APPLIED SCIENCES

February 12, 2007

Program Director
S-STEM Program
National Science Foundation,
Arlington, VA 22230

Re: Letter of Support for the S-STEM Proposal from Hope College

Dear Sir or madam,

On behalf of Hope College, I am thrilled to provide my strongest support for the proposal submitted by Professor Herb Dershem to the S-STEM program. To demonstrate Hope's commitment to STEM education and to encourage more students to pursue careers in STEM areas, we will provide matching funds in the form of summer research support for these students in excess of what is requested from NSF. This will amount to as much as $56,640 plus housing for the summer for these students. This application is especially exciting to me for the reasons described below:

First, the principal investigator is a highly accomplished teacher-scholar who has a proven record of successfully obtaining and implementing external grants, including many from the NSF. This program will provide scholarships of $10,000 per year for two years to 24 students who will transfer to Hope College in a STEM discipline from the partnering 2-year community colleges. In addition, it will provide the students with an opportunity to complete their studies in a proven and successful curriculum that capitalizes on our strength in STEM education and undergraduate research within the context of a nurturing liberal arts college environment.

Second, Hope College is a national leader in STEM education; with more than 25% of our students graduating in these disciplines. About 50% percent of these students go on to pursue graduate degrees. We strongly feel that our success in producing such a large percentage of STEM majors is a direct result of our guiding teaching philosophy, that is ***learning science is done be by doing science***. Our faculty and administration work extremely hard to provide state-of-the-art facilities and resources to promote high quality faculty-student collaborative research projects. In 2006, more than 170 students and 50 faculty members in the Division of Natural and Applied Sciences at Hope College participated in summer research. Also, in 2006 our students and faculty produced more than 140 journal articles and books, and more than $1.2 Million in external funding was received. I strongly feel that Hope College is an ideal institution to have an S-STEM award, so that we can provide this type of learning opportunities to the transfer students.

Third, this project addresses an imminent need for our country, and that is to encourage more students to pursue degrees in STEM fields, especially students from groups who are presently underrepresented in the STEM areas. I am enthused with the relationships we are developing with 2-year community colleges. These institutions have huge numbers of untapped, yet talented, students for STEM careers, and the majority of these students come from groups underrepresented in the sciences.

Fourth, for the nation to succeed in attracting new students to the STEM fields, and in order to have a positive impact in the future, the program must be sustainable. Hope College has worked diligently in the past few years specifically to build new relationships with 2-year colleges. Our most recent relationship has been created with the City Colleges of Chicago, in which we are a partner in their NSF funded URC (undergraduate research collaborative) program in chemistry. We are already seeing success in this collaboration. A chemistry student from Harper College (a 2-year college in Chicago and a member of the URC) has chosen to complete her 4-year baccalaureate degree at Hope College following a successful and productive summer research experience.

35 E. 12TH STREET / PO BOX 9000
HOLLAND, MICHIGAN 49422-9000 / 616-395-7190 / FAX 616-395-7923

In summary, Hope College enthusiastically supports the S-STEM proposal by Dr. Dershem. It creates a new model of productive collaboration between a large number of institutions, and it builds on the strengths of each partner. This synergistic effect will have a major impact in energizing a large number of students, who otherwise might not have access to research opportunities and to pursue careers in the sciences. As we have recently learned from such books as, "*The World is Flat*," and "*Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*," it is imperative that we motivate more students (especially from a diversity perspective) to embrace and pursue careers in the sciences. Dr. Dershem's S-STEM proposal will allow us as a nation to jump forward with a bright outlook of producing more scientists so that success in future scientific discoveries and innovation is ensured.

Yours truly,

Moses Lee Ph.D.
Dean of Natural and Applied Sciences
& Professor of Chemistry

HOPE COLLEGE

DEPARTMENT OF KINESIOLOGY

MEMORANDUM

DATE: February 15, 2007

TO: Dr. Herbert L Dershem
Department of Computer Science

FROM: John Patnott, Chairperson
Kinesiology Dept.

RE: Research proposal approval

Your research proposal titled "Scholarships for Transfer Students in Science, Engineering, and Mathematics." has been approved by the HSRB. This project should receive exemption #1 from the National Science Foundation. Never-the-less, the HSRB approves your proposal.

Thank you for submitting your proposal and I hope all goes well with your project.

DEVOS FIELDHOUSE / 222 FAIRBANKS AVENUE / PO BOX 9000
HOLLAND, MICHIGAN 49422-9000 / 616-395-7690 / FAX 616-395-7175

Proposal Status | MAIN

Organization: Hope College

Proposal Detail:

Proposal Information

Proposal Number:	0728574
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Received by NSF:	02/16/07
Principal Investigator:	Herbert Dershem
Performing Organization:	Hope College

This Proposal has been Electronically Signed by the Authorized Organizational Representative (AOR).

NSF Program Information

NSF Division:	Division of Undergraduate Education
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Program Officer:	Linnea A. Fletcher
PO Telephone:	(703) 292-8670
PO Email:	lafletch@nsf.gov

Proposal Status

Status As of Today Dated: **02/18/09**

Award **0728574** was made on **08/29/07** for **$ 564,360.00** with an effective date of **09/01/07**.

Award Duration: **60** (months)

Comments from the cognizant Program Officer:

Congratulations on receiving an award in the NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program in fiscal year 2009. Your award is one of about 85 new S-STEM awards that will be made by the Division of Undergraduate Education this year. These awards are a result of the evaluation of 277 proposals submitted in August 2008. Thus, your project is in a select group nationwide.

This memo provides information on S-STEM policies and project administration.

In FastLane, you may access verbatim, anonymous copies of the reviews of your proposal, as well as a Context Statement that provides general information about the program this year. Your organization's grants office should have received an official award letter from NSF via e-mail or, in some cases, on paper. You may retrieve a copy of the award letter by using FastLane's "View/Print Award Letters" function. The award letter identifies both a program officer and a grants officer who are responsible for the oversight of your project. Academic and scientific questions that arise during the course of the project should be directed to the program officer, and financial and administrative questions should be directed to the grants officer.

Most grants are governed by the Research Terms and Conditions (RTC) and NSF RTC Agency Specific Requirements, which can be found on NSF's Web site at http://www.nsf.gov/awards/managing/rtc.jsp. Two other documents also provide answers to many questions and concerns that commonly arise during the course of an NSF grant:

* NSF Proposal and Award Policies and Procedures Guide, http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp
* "Frequently Asked Questions (FAQs) on Proposal Preparation and Award Administration," http://www.nsf.gov/pubs/gpg/faqs.pdf

We have confidence that your project will enable significant improvements in the education of undergraduate

students. So that the S-STEM program may achieve its greatest impact, your project should be managed in ways that will allow you to share what you have learned with teachers, college and university faculty, and other science, technology, engineering, and mathematics professionals. It is important to the program's future that you give appropriate visible credit to NSF and the program. Please include, in both publications (including Web sites) and talks, a statement and disclaimer (required by the Research Terms and Conditions) such as: "Partial support for this work was provided by the National Science Foundation Scholarships in Science, Technology, Engineering, and Mathematics (S STEM) program under Award No. 08XXXXX. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation." In addition, we encourage you to use the NSF logo on any formal advertising for your project, on your project's Web site, and on other materials resulting from your work. Electronic versions of the NSF logo, in various file formats, can be found at http://www.nsf.gov/policies/logo_use.jsp. Please send us copies of any press clippings that refer to your project.

We request that you provide up-to-date information to NSF and to the community about your project and the progress you are making by submitting timely reports through FastLane's Project Reports System. For all multi-year grants (including both standard and continuing grants), PIs must submit an annual project report via FastLane at least 90 days before the end of the grant's current budget period. Within 90 days after the expiration of a grant, PIs are also required to submit a final project report. To provide information to the public about projects funded through DUE programs, DUE has developed a Web-based Project Information Resource System (PIRS) at http://www.ehr.nsf.gov/pirs_prs_web/search/. This system is integrated with FastLane's Project Reports System. When you submit an annual, final, or interim project report to NSF via FastLane, some of the information that you provide--in particular, the "DUE Information" section of the project report--is made accessible to the public through PIRS. As your project progresses, we encourage you to keep your information up-to-date in FastLane and PIRS. You need not begin an annual or final project report to enter information in PIRS; you may submit an interim report at any time. When you prepare a project report in FastLane, it is important that you TYPE OR COPY-AND-PASTE ALL SIGNIFICANT INFORMATION INTO THE TEXT BOXES instead of attempting to upload your entire report as a PDF file, because PIRS cannot display the content of PDF files.

Evaluation is an important component of your project, both for your use and for NSF's purposes. We encourage you to start the evaluation process at the initial stages of your project and continue throughout the activity period. Several resources may be particularly helpful to you:

* The 2002 User-Friendly Handbook for Project Evaluation (NSF 02-057), http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf02057
* User-Friendly Handbook for Mixed Method Evaluations (NSF 97-153), http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf97153
* Online Evaluation Resource Library, http://oerl.sri.com
* Field-tested Learning Assessment Guide (FLAG), http://www.flaguide.org

In addition to the S-STEM program, DUE is administering eight other programs in fiscal year 2009. You can find information about these programs on the division's Web site at http://www.nsf.gov/div/index.jsp?div=DUE. Please alert interested colleagues about them.

If you or a colleague would be interested in reviewing proposals submitted to DUE, please complete a Reviewer Background Information Form (NSF Form 428A) and return it along with a current resume. The form is available on the Web at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=form428a.

Once again, congratulations on succeeding in a highly competitive activity.

Sincerely,

Linda L. Slakey
Director, Division of Undergraduate Education

Reviews

All of the reviews of your proposal that have been released to you by your NSF program officer can be viewed below. Please note that the Sponsored Project Office (or equivalent) at your organization is NOT given the capability to view your reviews.

Document:	**Release Date:**
Panel Summary #1	Jul 18 2007 5:54PM
Review #1	Jul 18 2007 5:54PM
Review #2	Jul 18 2007 5:54PM
Review #3	Jul 18 2007 5:54PM
Review #4	Jul 18 2007 5:54PM
Review #5	Jul 18 2007 5:54PM

Context Statement

General Information for Applicants, FY2007

For the February 16, 2007, deadline, the NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program received 251 proposals requesting about $139 million. Of these, 249 proposals were determined to be eligible for review. It is anticipated that approximately $50 million will be available to support S-STEM projects in FY2007. These funds will permit support of approximately 90 awards.

Each proposal was evaluated by a panel of reviewers, who had electronic access to the proposals assigned to that panel through NSF's FastLane system. Each reviewer read proposals and wrote individual reviews, and then the panel convened as a group to discuss the proposals under consideration. Following these discussions, reviewers finalized their individual written reviews of each proposal. The written remarks are addressed to NSF and reflect the views of individual reviewers. For each proposal, one member of the panel prepared a summary of the discussion.

Decisions about particular proposals are often difficult, and factors other than reviewers' comments and ratings enter into the decision. Comments by a reviewer must sometimes be considered in the context of other reviews by the same person. The amount of funds available to the program for proposals and general Foundation policies are also important decision factors.

Principal and Co-Principal Investigators may read the Panel Summary and the individual reviews of their proposal via FastLane. Please feel free to contact the cognizant program officer if more information would be helpful. To see the awards that are made as a result of this competition, you are encouraged to consult the Division of Undergraduate Education's (DUE) Web-based *Project Information Resource System (PIRS)* at http://www.ehr.nsf.gov/pirs_prs_web/search/. This resource is intended to provide access to current information about projects funded by NSF through the programs in DUE.

The next deadline for S-STEM proposals is November 13, 2007. Please visit DUE's Web site (http://www.nsf.gov/div/index.jsp?div=DUE) for more information and to view the program solicitation.

Back to Status Search Results

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security

Proposal Status | MAIN

Organization: Hope College

Panel Summary #1

Proposal Number: 0728574

Panel Summary:
Panel Summary

Hope College purposes to recruit STEM students from a well-established articulation with the surrounding community colleges. Hope purposes to offer 8 transferring students scholarships each year over three years. The scholarships are renewable for a second year.

This innovative approach is a strength of the proposal. Strength is found in the reported pipeline and networking with instructors and administrators from the listed community colleges. Other strengths of the proposal are found in the financial incentive, opportunity to participate in undergraduate research, and close faculty-student and working relationships; these are great assets and combining them with the academic support system makes for a good recruitment and retention plan.

Hope College's commitment to undergraduate research is evidenced by the commitment to contribute up to $56,640 in summer undergraduate research for participants. The reviewers see this as a major strength.

Another strength is recruiting students who have weathered two years of community college and gained intellectual and scholastic maturity - this reduces the need for heavy remediation on Hope College. likewise this proposal utilizes the established student support services. The PI, the faculty mentor/instructors, and the Program Leadership Team all working in overlapping roles makes for a well articulated proposal.

Broader Impacts:

The novel approach to get students to jump into research the summer before the academic year at Hope, is a plus and a strength of the program, as is piggy-backing on the ongoing CSEMS program.

The panel would like to see more input on how to recruit and mentor minority and female students by having someone on the project staff designated to be the focal point for this area; equally important is a strategy for staff, faculty and the Leadership Team to be aware of the need of to deal with non-traditional student issues: child care, single parent students, extended family and transportation issues.

The articulation with University of Michigan, the K-12 underrepresented outreach program, and the NSF-REU program are major strengths of this proposal. Hope College has created an excellent pipeline to work with each educational level. The idea of the PI's inclusion of undergraduate scholarship funds for research is a good idea. Students must maintain a GPA of 2.5 or better to retain the scholarship, to "...encourage students at all satisfactory levels of achievement to obtain their degrees in STEM disciplines at Hope College". The reviewers appreciate this emphasis. The concept of an "innovative curriculum which[sic] intertwines student learning and faculty development" makes this proposal outstanding in its depth and breath.

However, the reviewers feel that assessment needs more detailed explanation. The dissemination plan could be improved, especially since this is a meritorious project that could and should be adapted to other colleges.

The design of the Advisory Committee, consisting of representatives from the six community colleges, is appropriate and very desirable, as is the make-up of the oversight oversight committee.

The reviewers would like to see the student interviews be conducted by a minimum of two faculty members - three would be preferred.

Summary Statements:

This proposal is informative, concise, well thought out and capable of success. It is a refreshing read and concept. The writer did a fine job of presenting supportive data (tables and charts) to make a case for the proposal.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security

Proposal Status | MAIN

Organization: Hope College

Review #1

Proposal Number:	0728574
Performing Organization:	Hope College
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Principal Investigator:	Dershem, Herbert L
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Rating:	Very Good

REVIEW:

What is the intellectual merit of the proposed activity?

The project provides scholarships for students with financial need who transfer to Hope College from a community college to major in biology, chemistry, computer science, engineering, geological and environmental sciences, mathematics or physics. The scholarships are offered to 8 transferring students each year over three years. The scholarships are renewable for a second year.

Hope has a previous NSF funding and provided good data on the success of the project. The results of the CSEMS project thus are impressive. The financial incentive, opportunity to participate in undergraduate research, close faculty-student working relationships are great assets and combining them with the academic support system makes for a good recruitment and retention and plan.
The writer did a fine job of presenting supportive data (tables and charts) to make a case for the proposal.
The support system outlined including research, orientation, housing, peer mentoring, etc, are strong attractors for community college students and keys to retention.
An added plus must be given to the proposal writer for the scholarship renewal section. A lower gpa requirement for transfer students indicates a clear understanding of the transition the students will be facing.
Hope College's commitment to this program is evidenced by the commitment to pay up to $56,640 in summer undergraduate research cost for participants.

What are the broader impacts of the proposed activity?

This program will attract people who may not have considered STEM majors because of their attendance at non-STEM major institutions. The articulation agreements with the community colleges set the stage for early consideration of STEM degrees. Working with the community college can be a means of increasing the diversity of students majoring in STEM areas. This type of venture can make the STEM majors more affordable by allowing for the first two years of education to come from a community college (less expensive than most four year institutions).
The evaluation and assessment component, if conducted anything like the data presented on the CSEMS project, is a fine plan

Summary Statement

The proposal is informative, concise, well thought out and capable of success. It is a refreshing read and concept.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security

Proposal Status | MAIN

Organization: Hope College

Review #2

Proposal Number:	0728574
Performing Organization:	Hope College
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Principal Investigator:	Dershem, Herbert L
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

Hope College purposes to recruit from a well-established articulation with from the surrounding community colleges. This is a strength of the proposal. Strength is the reported pipeline and networking with instructors and administrators from listed community colleges. Another strength is the PI's taking students who have weathered two years of community college, and have matured, and gained intellectual and scholastic maturity - this reduces the need for heavy remediation on Hope behalf; likewise this proposal utilizes the established student support services û makes it another strength of this proposal. The PI, the faculty mentor/instructors, and the Program leadership Team all working in overlapping roles û makes this a strong proposal.
The novel approach to get students to jump into research the summer before the academic year- is a plus and a strength of the program, as is pigging-backing on the ongoing CCSEMS program

What are the broader impacts of the proposed activity?

This program has a reasonable tier hierarchy that is neither bureaucratic nor nebulous - this provides for a grounded approach to student selection, student mentoring - and program prestige.
However this reviewer would like to see more input on how to recruit and mentor minority and female by having someone on staff designated to be the focal point for this area; equally important is a strategy for staff, faculty and the Leadership Team to be aware of the need of how to deal with non-traditional student issues: child care, single parent student, extended family and transportation issues.
The articulation with University of Michigan; the K-12 underrepresented outreach program, and the NSF-REU connection are major strengths of this proposal. Hope College has created an excellent pipeline to work with each educational level.

This is a quality proposal in that it covers all the major points: Student recruitment and selection, the concept of an "innovative curriculum which intertwines student learning and faculty development" makes this proposal outstanding in this depth and breath. The number of students conducting research, and the connection to NSF-REU, makes this project a prestigious one.

Summary Statement

However the continuation of the program needs to be addressed, as does the methodology and the sequencing of the courses for the STEM curriculum, at the very least what classes are initially expected to be taken each semester in the perspective STEM disciplines.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security

Proposal Status | MAIN

Organization: Hope College

Review #3

Proposal Number:	0728574
Performing Organization:	Hope College
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Principal Investigator:	Dershem, Herbert L
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

Hope College proposes to award two-year scholarships to eight students annually transferring from two-year institutions and majoring in any of the STEM field. The plan given on page 4 for awarding the scholarships is an excellent providing continuity to the effort and assuring the tranferees of the financial resources necessary to complete their degree program at Hope. While Hope has in the past had very few transfer students from nearby community colleges, the expectation that they will be able to recruit six STEM students from the six community colleges in the geographic region is reasonable.

The college offers a full array of student support services including peer tutoring, help sessions, workshops, and academic counseling in both individual and small group formats. Undergraduate research opportunities will be available to all scholarship holders.

The project leadership team has representatives from each of the six science departments and from the Dean of Natural Sciences office. The oversight committee charged with evaluating the project consists of the PI, the Dean of Natural Sciences, VP for Admissions, the Director of Financial Aid and the Dean for Academic Services and Registrar. Although not totally independent of the PI, this group is considered suitable to conduct the evaluation. The Advisory Committee consisting of representatives from the six community colleges is appropriate and very desirable. This group will be instrumental in the recruitment effort.

All scholarship candidates will visit the Hope campus. During this visit they will have an interview with the PI. This reviewer recommends that participation in the interview process by at least one other member of the Project Leadership Team occur.

The proposal does not contain a list of major equipment available for instruction and/or research. Since Hope College has three current NSF-REU awards, it is presumed that the necessary major equipment items are present; however, the proposal would be improved by inclusion of an equipment list.

One goal of the project according to the proposal summary is to increase the diversity of the Hope College student body; however, no plans for accomplishing this are described, nor is progress toward this goal to measured by the evaluation.

What are the broader impacts of the proposed activity?

The project will strengthen the working relationship between the four-year institution and nearby community colleges, increase the number of graduates in a STEM field and increase the diversity of the scientifically skilled workforce.

Summary Statement

This is a very strong proposal and this reviewer enthusiastically supports funding of the proposal provided that a plan for increasing diversity is submitted to NSF and that the student interviews be conducted by a minimum of two faculty members. Three would be preferred.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security

Proposal Status | MAIN

Organization: Hope College

Review #4

Proposal Number:	0728574
Performing Organization:	Hope College
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Principal Investigator:	Dershem, Herbert L
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Rating:	Very Good

REVIEW:

What is the intellectual merit of the proposed activity?

This project will provide eight transferring students from community colleges $10k each for two years. This proposal is well written and presented in a way that is easily understandable. This novel concept is original and creative. The investigators are well qualified as manifested by prior support. The duty of each senior staff is clearly stated. The letters of support indicated the networking with community colleges in the service area will be strengthened.

What are the broader impacts of the proposed activity?

This proposal does state that underrepresented groups would be represented but how this issue is accomplished is not noted. This reviewer feels that the only broader impact considered was those students which do not consider attending a private liberal and not other groups. This proposal builds previous proposals, which is very good.

Summary Statement

This reviewer feels that this proposal is very good. It is clearly stated what each team of investigator will perform. This review can become excellent by elaborating more; including the methods which will be used to impact the broader impact.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

Proposal Status | MAIN

Organization: Hope College

Review #5

Proposal Number:	0728574
Performing Organization:	Hope College
NSF Program:	S-STEM: SCHOLARSHIPS IN SCI, TECH, ENG, AND MATH
Principal Investigator:	Dershem, Herbert L
Proposal Title:	Scholarships for Transfer Students in Science, Engineering, and Mathematics
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

Hope College proposes to award 3 cohorts of 8 transfer students $10k 2 year scholarships, for a total of 24 students. These students will most likely be from the 6 community colleges with which Hope College has just signed articulation agreements. This proposal builds on the documented success of the previous CSEMS grant, tying together the student cohorts served by these two grants via mentoring. This is a strength of the proposal.

The incoming scholarship recipients will be given the opportunity to participate in summer undergraduate research at Hope College (primarily at the institution's expense). This is a major strength of the proposal, given that the experience will help integrate these transfer students into the culture and community of Hope College, in addition to the inherent benefits that students receive by participating in undergraduate research.

The management of this project is well thought out, including a Leadership Team, and Oversight Committee, and an Advisory Committee. Pertinent stakeholders are included in these committees, and this is considered a strength of the proposal. This reviewer would encourage the addition of women and (if not already present) underrepresented minorities on the Project Leadership Team.

The recruiting plan is well laid out, with attention paid to diversity - another strength of the proposal. The S-STEM orientation workshop is a laudable way for the recipients to begin to associate with one another, and to make the recipients aware of the resources available to them. Having a monthly meeting with a faculty advisor is another way that the recipients will be engaged in the campus community - another strength of the proposal.

Students must maintain a GPA of 2.5 or better to retain the scholarship, to "encourage students at all satisfactory levels of achievement to obtain their degrees in STEM disciplines at Hope College". This reviewer appreciates that emphasis.

What are the broader impacts of the proposed activity?

This proposal will increase the number of community college students able to transition to a 4 year institution, and will increase the retention of community college transfers in STEM disciplines at Hope College. There is an intent to increase the diversity of STEM graduates at Hope through this scholarship program.

The assessment plan seems appropriate, but the dissemination plan could be improved, especially since this is such a meritorious project that could and should be adapted to other colleges.

Summary Statement

Hope College proposes to award 3 cohorts of 8 transfer students $10k 2 year scholarships, for a total of 24 students. These students will most likely be from the 6 community colleges with which Hope College has just signed articulation agreements. This proposal will increase the number of community college students able to transition to a 4 year institution, and will increase the retention of community college transfers in STEM disciplines at Hope College.

Back to Proposal Status Detail

Download Adobe Acrobat Reader for viewing PDF files

National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090

Privacy and Security