# Proposal Information

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<td>Proposal Number</td>
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<tr>
<td>Proposal Title</td>
<td>MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory</td>
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<tr>
<td>Received on</td>
<td>01/23/03</td>
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<tr>
<td>Principal Investigator</td>
<td>Benjoe Juliano</td>
</tr>
<tr>
<td>CO-PI(s)</td>
<td>Renee Renner, Ramesh Varahamurti</td>
</tr>
<tr>
<td>Institution</td>
<td>Cal State U Chico Res Fdtn</td>
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# Program Information

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<tr>
<td>NSF Division</td>
<td>DIVISION OF EXPERIMENTAL &amp; INTEG ACTIVIT</td>
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<tr>
<td>Program Name</td>
<td>MAJOR RESEARCH INSTRUMENTATION</td>
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<tr>
<td>Program Officer</td>
<td>Rita V. Rodriguez</td>
</tr>
<tr>
<td>Telephone</td>
<td>(703) 292-8980</td>
</tr>
<tr>
<td>E-Mail</td>
<td><a href="mailto:rrodrigu@nsf.gov">rrodrigu@nsf.gov</a></td>
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# Proposal Status

Status As of Today Dated: **07/28/03**

A program recommendation for award was concurred with by the cognizant Division/Directorate on **07/03/03**. However, no award is ensured and the recommended duration is **36** months with an effective date of **08/01/03** are subject to change. The grantee institution assumes any pre-award costs at its own risk. NSF may request additional information.

Award Duration: (months)

This recommendation was received in the Division of Grants and Agreements on **07/08/03**. The NSF Grants Officer issuance of an award may require 4 weeks or more from the receipt of the recommendation in Division of Grants and Agreements.

Dear MRI Applicant:

Your proposal to the Major Research Instrumentation (MRI) program FY 2002 competition was received by the National Science Foundation. The information below will help you follow the progress of your proposal from program assignment through final action.

The approximate schedule for processing the FY 2002 MRI proposals is as follows:

- **January 24, 2002**: Deadline for submission of proposals.
- **February, 2002**: Administrative review of proposals for completeness and conformance to NSF guidelines; Directorate review of proposals for conformance to MRI guidelines; Proposal transfers to other NSF programs, if required.
- **March - June, 2002**: Panel and ad hoc reviews completed.
- **June - July, 2002**: Award and declination actions completed at the Directorate level.
- **August, 2002**: Formal notification of awards and declinations.

As you probably know, MRI proposals are assigned to the appropriate Directorate and Division within NSF to be processed. The review process and specific dates of proposal processing will vary from program to program within the general timeframe presented above. Information about the receipt and assignment of your proposal, including the proposal title; the date NSF received the proposal; the name of the NSF program to which the proposal is assigned; and the name, telephone number, and email address of the Program Officer to whom your proposal is assigned; are available in the FastLane Proposal Status Inquiry module.

Notification of awards will be made electronically to the institution's sponsored projects office, and notification of declinations will be made directly to applicants.

A complete list of MRI awards for the FY 2002 competition will be published on the Office of Integrative Activities (OIA) web page.
Best of luck with your research and education efforts.

Regards,
Joseph F. Burt
MRI Program Coordinator
Office of Integrative Activities
National Science Foundation

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 Research Office (or equivalent) at your organization is NOT given the capability to view your reviews.

Document Release Date

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<tr>
<td>Panel Summary #1</td>
<td>May 8 2003 4:01PM</td>
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Context Statement
This year, 736 MRI proposals were submitted to NSF. 44 proposals were targeted for CISE-MRI, managed by the Division of Experimental and Integrative Activities (EIA). In accordance with the usual practice, a panel of scientists and engineers was convened to provide evaluations of the proposals. Based upon their reviews and evaluations, and with the funds available to the program this year, we expect to be able to recommend around 33% of these proposals for awards. The proposals were discussed during the panel meeting, and the panel arrived at a recommendation to NSF. In cases where there were conflicts of interest, the panelists with the conflicts did not evaluate or participate in the discussion of the conflicted proposals.

Verbatim copies of all completed reviews for your proposal are available, attached, or enclosed, as is the panel summary. In reading these, please keep in mind that the reviewers are addressing their comments primarily to the National Science Foundation, not to the proposer. Although many reviews do provide helpful information, they sometimes make remarks without giving detailed references or providing specific suggestions for improvement. Some reviews may contain non-substantive, irrelevant, or erroneous statements that the program officer did not use in evaluating the proposal.

Decisions about particular proposals often prove very difficult, and factors other than the reviewer's comments and ratings may influence the decisions. While the scientific merit of the proposal and its worthiness in relation to other proposals received in the same competition are always critical considerations, maintaining appropriate balance among subfields, availability of other funding, amount of funding available to the program, and the geographic distribution of projects supported by the Foundation are also important decision factors.

Additional information about the decision on your proposal is provided separately. If you would like further information about the evaluation or the program itself, please contact Rita V. Rodriguez, Program Director, NSF/CISE/EIA, at (703) 292-8980, or via email: rodrigu@nsf.gov.

Information about reconsideration of declined proposals is found in the NSF's Grant Policy Manual. This manual should be available at your institution, usually at the office which formally submitted your proposal or on the NSF web at http://www.nsf.gov/cgi-bin/getpub?gpm. Foundation policy is to accept a revised proposal for review and evaluation as a new proposal, in accordance with the designated program deadlines, if reviewer's comments have been substantially addressed.

Back to List of Proposals
Panel Summary #1

PROPOSAL NO.: 0321385

PANEL SUMMARY:

Intellectual Merit:

The panel agrees that this RUI proposal is very strong in education and in potential integration of education and research. The PIs carefully planned a good mix of robots of different levels of sophistication that could well meet the intended goals of research and education in intelligent systems. While the research areas are not yet well-defined, the planned participation in RoboCup or AAAI Mobile Robot Competitions could essentially provide important and fundamental research topics. The PIs are encouraged to study the related state-of-the-art literature and strengthen the research component.

Broader Impacts:

The impact of this proposal on education could be significant. The PIs are enthusiastic and are already quite active in attracting women and underrepresented minority students in their research and teaching activities. The panel also commends their outreach activities in summer robotics camps for high school students, especially a girls’ summer robotics camp.

The panel thinks that this is an excellent RUI proposal and ranks it as Competitive.

PANEL RECOMMENDATION: Competitive

Back to Proposal Status
Review #1

PROPOSAL NO.: 0321385
INSTITUTION: Cal State U Chico Res Fdn
NSF PROGRAM: MAJOR RESEARCH INSTRUMENTATION
PRINCIPAL INVESTIGATOR: Juliano, Benjoe A
TITLE: MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory
RATING: Good

REVIEW:

What is the intellectual merit of the proposed activity?

The strength of this proposal is primarily in intelligent systems education and the potential to integrate education with research. The PIs request funding for 85 robots (including LEGO Mindstorm and other kinds). The research activities are not yet clearly defined. The PIs have a good plan of activities related to the utilization of the proposed equipment. However, the requested robots may be too many.

What are the broader impacts of the proposed activity?

The broader educational impacts are very strong. There is a potential for collaboration with established research labs in nearby universities so that students can have more exposure to research. The planned activities for robotics summer camps for high school students, including a girl's summer robotics camp, are laudable.

Summary Statement

The RUI proposal has strong education component, but the research component is lacking. It may be appropriate to fund the proposal with a reduced scope.
Review #2

PROPOSAL NO.: 0321385
INSTITUTION: Cal State U Chico Res Fdn
NSF PROGRAM: MAJOR RESEARCH INSTRUMENTATION
PRINCIPAL INVESTIGATOR: Juliano, Benjoe A
TITLE: MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory
RATING: Multiple Rating: (Very Good/Good)

REVIEW:
What is the intellectual merit of the proposed activity?

This proposal is a request for a total of 86 robots of differing complexities (basic kit, intermediate, and advanced). The objective is to set an intelligent system laboratory (ISL). The PI will also attempt to establish an institute for Research on Intelligent Systems (IRIS) to raise the prospects for collaborative work with other entities and institutions.

The research activities are not detailed to assess their impact or to anticipate new concepts or creative endeavors that will enhance our understanding of the proposed research activities, especially in surveillance and threat detection as mentioned in project description.

PIs are qualified.

What are the broader impacts of the proposed activity?

Impact on student learning and participation is well documented.

Recruitments efforts of underrepresented groups are noted.

Research impact is not evident as the one for teaching purposes and learning with hands-on experimentation.

Summary Statement

PI’s have written a good proposal in terms of efforts to create an ISL Lab and the IRIS Institute. There are good efforts in outreach, teaching, and dissemination.

The proposal would have been stronger if more focus was placed on the research merit especially in some of the key activities mentioned in Section 1 of the project description.

Very Good rating (if the research part was detailed in terms of the equipment request and the incremental benefit anticipated).
Proposal Status Inquiry: Review #3 Details of Proposal 0321385

Review #3

PROPOSAL NO.: 0321385
INSTITUTION: Cal State U Chico Res Fdtn
NSF PROGRAM: MAJOR RESEARCH INSTRUMENTATION
PRINCIPAL INVESTIGATOR: Juliano, Benjoe A
TITLE: MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory
RATING: Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

The intellectual merit is education-oriented, but the research potential is very high and would enable this RUI to conducted research. CSU Chico could duplicate Swarthmore’s successes. The intellectual merit of the education-oriented research is high, with the proposal explicitly discussing the need to track the utility of the ISL and experiences.

What are the broader impacts of the proposed activity?

This project has a very high likelihood of making an extremely large impact. Within USC Chico it could fundamentally change the nature of courses in CS and Engineering, providing hands-on computational activities. It could provide a strong background for students to work at JPL and start up companies (Evolution.com) and leverage the expertise of local engineers in robot hobby groups who will be able to mentor CSU Chico students (and help them get high-tech jobs). The plan to recruit women students through the Summer Camp and minorities through other experiences is well-motivated and likely to succeed, providing a high leverage for diversity. The obvious enthusiasm of the PIs is to be commended.

Summary Statement

The central concept is to buy a family of robotics equipment, set up courses and a girls summer camp. It provides a high leverage/target audience of undergraduates (115) plus 12 grad students to set up and run.

This project clearly integrates research and education. While the research activities are not well-defined, this should not be a problem if the researchers commit to RoboCup or AAAI Mobile Robot Competitions—this competitions essentially provide research questions already identified by the larger community as being fundamental and worthy. The choice of family of robots is very good, ranging from legos to ATRV-jrs. These platforms are well-known, versatile, not high maintenance, and have good interfaces. The proposal makes a strong case for how it can be used for education from many departments and for research. The platforms are well-suited for research and would give the faculty a solid foundation. All platforms are well-known and not high maintenance/reasonable. The management plan focuses on how to support the multiple departments and how to both generate use of the ISL facilities as well as how to regulate it.

The project would probably yield a large set of instructional materials that could be replicated at other institutions, creating the next generation. The proposal clearly identifies private sector resources (hobby groups) and academic researchers (universities and JPL). A suggestion for logical partnering options—USC and Mataric’s lab may provide more natural interaction since behavior-based (Mataric was one of Brooks’ grad students).

The project management is convincing with courses laid out, reasonable sequencing of purchases and manpower to bring the resources on-line.

The only weakness of the proposal is a correctable lack of familiarity with the robotics education literature. In particular see Robots and Kids (Druin and Hendler) for a discussion of summer camps with legos for kids. The textbook Intro to AI Robotics (Murphy) has lego-based instructional materials. Frontiers in Education typically has several papers on using robots for education. Robotics and Automation Society Magazine June 2001 issue was on education. IEEE Robotics and Automation Society educational committee is another resource. The North American chair Marge Skubic (Missouri) has developed lego-based courses and Ayden Erkmen has also developed internet delivery of robot education experiences.

In terms of leveraging educational activities for research: Look at Swarthmore’s (Maxwell, Meeden) participation in RoboCup and AAAI Mobile Robot Competitions for inspiration. Swarthmore has combined undergrad education (2 semester sequence) with these competitions in summer to generate undergrad research opportunities and publishable research results for faculty. Most recently Swarthmore joined with CMU, NRL, and NASA to create Grace, an fully autonomous mobile robot that navigated a convention center to register for a conference and give a talk.
PROPOSAL NO.: 0321385
INSTITUTION: Cal State U Chico Res Fdtn
NSF PROGRAM: MAJOR RESEARCH INSTRUMENTATION
PRINCIPAL INVESTIGATOR: Juliano, Benjoe A
TITLE: MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory
RATING: Good

REVIEW:
What is the intellectual merit of the proposed activity?

The PIs focus almost exclusively on the educational mission of the ISL and IRIS. While they present good ideas, the MRI program is aimed at "expanding the scope of research and research training...and research-intensive learning environments." Their research plan is less developed, but the program provides an excellent roadmap to develop an education-centric research agenda.

For the educational component, the authors have presented an admirable methodology for developing courses with diverse and meaningful content for their students. By visiting top research labs and universities engaged in intelligent systems research, they can choose the best pedagogic examples to employ in their own classes as well as recruit speakers to come to campus to explain their research.

What are the broader impacts of the proposed activity?

The PIs show a clear commitment to broader impacts in their effort to build programs specifically targeted at recruiting underrepresented groups. The Girls' Summer Robotics Camp is an innovative avenue for this. They are specifically targeting undergraduate and graduate students for both educational and research opportunities and are attempting to integrate the two.

Summary Statement

The authors propose a clear and well-integrated course development plan. Three progressive courses are proposed to foster the development of students that will lead them to a level of understanding suitable for research.

The proposal would be strengthened by greater descriptions of the PIs intended line of research. This will also improve interaction with the research-intensive universities they plan to visit.
Proposal Information
Proposal Number 0321385
Proposal Title MRI/RUI - Acquisition of robotics equipment for an Intelligent Systems Laboratory
Received on 01/23/03
Principal Investigator Benjoe Juliano
CO-PI(s) Renee Renner, Ramesh Varahamurti
Institution Cal State U Chico Res Fdtn

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

Program Information
NSF Division DIVISION OF EXPERIMENTAL & INTEG ACTIVIT
Program Name MAJOR RESEARCH INSTRUMENTATION
Program Officer Rita V. Rodriguez
Telephone (703) 292-8980
E-Mail rrodrigu@nsf.gov

Proposal Status
Status As of Today Dated: 08/06/03
Award 0321385 was made on 08/06/03 for $346,188.00 with an effective date of 08/15/03.

Award Duration: 36 (months)

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A complete list of MRI awards for the FY 2002 competition will be published on the Office of Integrative Activities (OIA) web page (http://www.nsf.gov/od/oia/start.htm) once all awards have been made.

Best of luck with your research and education efforts.
Regards,

Joseph F. Burt
MRI Program Coordinator
Office of Integrative Activities
National Science Foundation

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