

**From:** "Robert J. Hanisch" <hanisch@stsci.edu>  
**Subject:** your Spring 2014 DDRF/JDF proposal  
**Date:** May 12, 2014 10:29:37 AM EDT  
**To:** Massimo Robberto <roberto@stsci.edu>  
**Cc:** Neill Reid <nrr@stsci.edu>, Alisa Meizlish <meizlish@stsci.edu>

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Dear Massimo,

I am pleased to inform you that the Research Support Advisory Committee has recommended, and the Director has concurred, that your recent proposal for DDRF/JDF support should be funded. A summary of the RSAC's comments is appended below.

I will provide you with a charge number as soon as the account has been set up by Accounting.

I would like your permission to post your proposal on the SMO Confluence page so that other members of the research staff can see what makes a successful proposal. If you have concerns about sharing your proposal, I would still appreciate an ok to post just the abstract. Please let me know.

Congratulations on your successful proposal and I wish you all success with the project!

Bob

**Massimo Robberto: "SAMOS: Seed Funds for Opto-Mechanical Design"**

**Abstract:**

We ask for seed funding to design an innovative type of spectrograph of strategic importance to STScI. The 4.2m SOAR telescope at Cerro Pachon is now operating a GLAO Laser-Guided system (SAM) providing ~0.5" median resolution (I-band) over a HST-like 3'x3' field of view. SAM can be equipped with a novel multi-object spectrograph (SAMOS) to carry out spectroscopic follow-up of HST observations. In collaboration with JHU and the SOAR consortium, we plan to apply for NSF funding this coming fall. Support is required for the development of the opto-mechanical design at JHU, needed to bring the NSF proposal to maturity.

**Request:**

\$59,415 DDRF, \$67,570 JDF

**RSAC Comments:**

This proposal is to develop a new type of spectrograph for the 4m SOAR telescope equipped with ground-layer AO (GLAO) and a laser guide star (LGS). With this GLAO system the goal is to obtain 0.5" resolution in I-band over a 3 arcmin HST-like FOV, which corresponds roughly to a factor of two improvement in image quality compared to the seeing-limited case. On the best nights the system can reach ~0.25".

The proposed multi-object spectrograph builds on commercial MEMS devices from Texas Instrument, which are used in commercial video projectors. Since HST does not have a multi-object spectrograph follow-up in dense regions this is an important science case. 8m telescopes typically are either seeing limited or have AO in only a small FOV. The possible science cases for this instrument are vast; they include stellar populations, star formation regions, clusters of galaxies, blue stragglers, and white dwarfs.

The proposal is to provide seed funding in order to prepare a large NSF proposal to build this instrument. This instrument would be a collaboration with JHU and SOAR and other institutions. Specifically, the DDRF funding would be used for producing a detailed opto-mechanical design by the IDG group at JHU, to demonstrate the feasibility of the instrument prior to the NSF proposal. The technical difficulty is to accommodate the small packaging constraints and come up with a design prior to the proposal deadline.

**Strengths:** The team has expertise in this field, and in successfully building instruments of this scope (IRMOS, WHIRC etc.). The PI is a recognized leader in MOS instrumentation in particular based on these MEMS devices to produce dynamically addressable, massively multi-objects instrument designs.

This proposal is of strategic interest for several reasons: 1) strong and vast science cases with complementarity to HST, 2) instrumentation in this area is attractive for many astronomers, 3) further developing this team's leadership in MOS instrumentation for future instruments or missions

**Weaknesses:** While the scope of work (6-7 full-time weeks of effort) is reasonable to come up with a preliminary opto-mechanical design, the reviewers were wondering if this could be achieved for less. The complementarity / competitiveness of this particular instrument compared to other existing GLAO instruments and in particular to the VLT-MUSE instrument (GLAO + MOS) should be better addressed in the upcoming NSF proposal.

