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Sent: Tuesday, January 31, 2012 12:15 PM

To: [astportfolio@nsf.gov](mailto:astportfolio@nsf.gov)

Cc: William Smith

Subject: NOAO-Gemini Consolidation Study by the AURA Board

On behalf of the AURA Board of Directors, I would like to submit the attached PDF file of a White Paper for consideration by the Portfolio Review Panel. This WP reports on the process and findings of a Working Group commissioned by the AURA Board to look into best models for consolidating the operations of NOAO and Gemini Observatory. Links to the full Working Group report and to extensive public comments to the report are included in the attached WP.

The Overview and Executive Summary Sections included in the WP are also listed here:

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Overview

In April 2011, the AURA Board of Directors created the AURA Consolidation Working Group (hereafter ACWG) and tasked it to identify the notional consolidation models that would best satisfy the recommendation made by the Astro2010 Decadal Survey, (now known by its report name: "New Worlds, New Horizons" or NWNH) for consolidating the facilities of NOAO and Gemini into a single operational structure. At its September 2011 meeting the AURA Board accepted the ACWG report and endorsed its conclusions. The Board also discussed the desire to move forward with the process of further developing, and ultimately implementing the model recommended by the ACWG for full consolidation of the two observatories. One step along that path was to publicly post the ACWG report via an AURA Web page and to solicit as well as post comments from the community about that report. The full report of the ACWG may be accessed via:

[http://www.aura-astronomy.org/news/2011/ACWG\\_Report\\_Rev\\_Nov29\\_2011.pdf](http://www.aura-astronomy.org/news/2011/ACWG_Report_Rev_Nov29_2011.pdf)

The comments posted publicly (some posters have asked for private input) may be accessed via:

<http://www.aura-astronomy.org/news/news.asp?newsID=279>

What follows below are an abridged version of the ACWG report and a summary of comment trends and findings, for consideration by the Portfolio Review Panel.

Executive Summary

The ACWG studied a number of different consolidation models and identified two viable options for the merging of NOAO with Gemini into a new common management framework. The first was a full consolidation model (FCM) in which both observatories are merged into a single new organizational structure headed by a single director, called the Chancellor. The second option was a hybrid model (HM) that can be considered as a partial consolidation model.

In this latter model the Gemini facilities maintain an independent status as a corporate entity that is governed by a board on which NOAO would have representation. The ACWG concluded that the primary criterion for consideration of any new management framework is the size of the US share. A full consolidation model is most appropriate for the case in which the US national share is the dominant share in the facility being merged, while the hybrid model is most appropriate in the case where the US national share is either not the dominant share or a minority share (e.g., WIYN, SOAR). In the case of Gemini, the departure of the UK from the Gemini partnership will effectively leave the U.S.

with a 65-67% share in the facility. Taking into account the needs and desires of all parties, the size of the U.S. share in Gemini and the requirement to be more responsive to the needs of the U.S. astronomical community, the ACWG concluded that the full consolidation model would be the most appropriate solution for merging the two observatories at this time.

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AURA and its Board of Directors appreciate the difficulty of the endeavor faced by the Portfolio Review Panel and stands ready to help the Panel in any way. Questions can be addressed directly to either Dr. William Smith and/or to me.

Sincerely,

Dan Clemens, Boston University  
AURA Board Chair

# **A Study of Potential Models for Consolidation of Gemini and NOAO:**

A White Paper for the Portfolio Review Panel, Submitted by the AURA Board

## **Overview**

In April 2011, the AURA Board of Directors created the AURA Consolidation Working Group (hereafter ACWG) and tasked it to identify the notional consolidation models that would best satisfy the recommendation made by the Astro2010 Decadal Survey, (now known by its report name: “New Worlds, New Horizons” or NWNH) for consolidating the facilities of NOAO and Gemini into a single operational structure. At its September 2011 meeting the AURA Board accepted the ACWG report and endorsed its conclusions. The Board also discussed the desire to move forward with the process of further developing, and ultimately implementing the model recommended by the ACWG for full consolidation of the two observatories. One step along that path was to publically post the ACWG report via an AURA Web page and to solicit as well as post comments from the community about that report. The full report of the ACWG may be accessed via: [http://www.aura-astronomy.org/news/2011/ACWG\\_Report\\_Rev\\_Nov29\\_2011.pdf](http://www.aura-astronomy.org/news/2011/ACWG_Report_Rev_Nov29_2011.pdf) The comments posted publically (some posters have asked for private input) may be accessed via: <http://www.aura-astronomy.org/news/news.asp?newsID=279>

What follows below are an abridged version of the ACWG report and a summary of comment trends and findings, for consideration by the Portfolio Review Panel.

## **Executive Summary**

The ACWG studied a number of different consolidation models and identified two viable options for the merging of NOAO with Gemini into a new common management framework,. The first was a full consolidation model (FCM) in which both observatories are merged into a single new organizational structure headed by a single director, called the Chancellor. The second option was a hybrid model (HM) that can be considered as a partial consolidation model. In this latter model the Gemini facilities maintain an independent status as a corporate entity that is governed by a board on which NOAO would have representation. The ACWG concluded that the primary criterion for consideration of any new management framework is the size of the US share. A full consolidation model is most appropriate for the case in which the US national share is the dominant share in the facility being merged, while the hybrid model is most appropriate in the case where the US national share is either not the dominant share or a minority share (e.g., WIYN, SOAR). In the case of Gemini, the departure of the UK from the Gemini partnership will effectively leave the U.S. with a 65-67% share in the facility. Taking into account the needs and desires of all parties, the size of the U.S. share in Gemini and the requirement to be more responsive to the needs of the U.S. astronomical community, the ACWG concluded that the full consolidation model would be the most appropriate solution for merging the two observatories at this time.

## **Background: Decadal Recommendation**

The most recent decadal survey, *New Worlds New Horizons in Astronomy and Astrophysics (NWNH)*, articulated frustration with the current governance of some of the major ground-based optical astronomical facilities, making the following recommendation: "To exploit the opportunity for improved partnership between federal, private, and international components of the optical and infrared system, NSF should explore the feasibility of restructuring the management and operations of Gemini and acquiring an increased share of the observing time. *It*

*should consider consolidating the National Optical Astronomy Observatory and Gemini under a single operational structure, both to maximize cost-effectiveness and to be more responsive to the needs of the U.S. astronomical community." (page 179)*

## Possible Consolidation Models

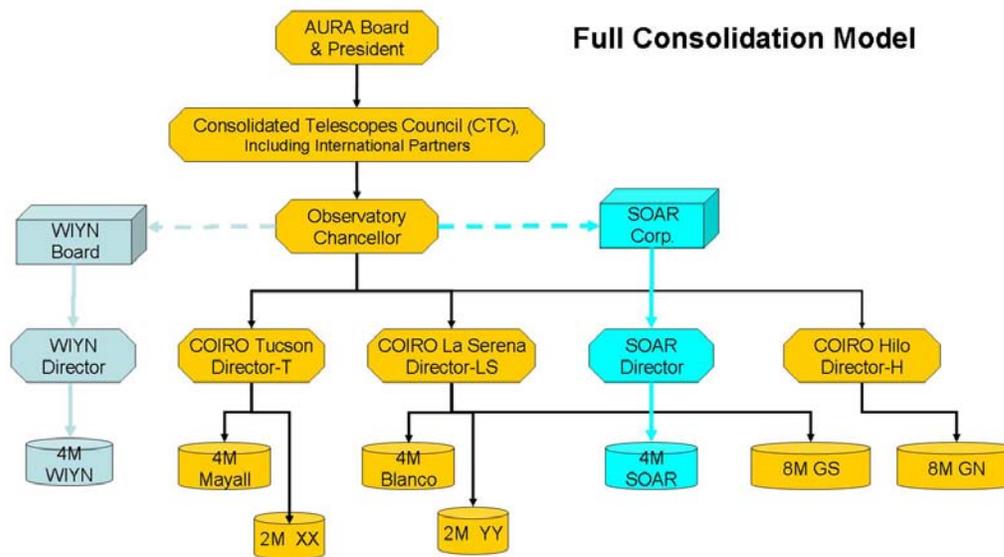
The ACWG considered various ideas and suggestions for the consolidation of NOAO and Gemini and converged onto two conceptual models as being the most relevant. A synopsis of each model is presented in this report along with associated pros and cons. For each model a flow (organization) chart is also shown.

### 1. Full Consolidation Model

#### Synopsis

This model combines the facilities of NOAO and Gemini into a single new organizational structure (that for the time being we designate the Consolidated Optical and Infrared Observatories, hereafter COIRO) with a single cooperative agreement and under a single upper-level director called the Chancellor. The flagship or highest priority facilities of this new observatory are the two 8-m Gemini North and South telescopes. In this model the observing facilities are organized by site (La Serena, Hilo and Tucson) with directors for each site. The two Gemini telescopes are thus managed and operated as individual units as part of one of these sites (either La Serena or Hilo). Federal funding for all facilities, including Gemini, flows through COIRO. This model provides the U.S. national community with a fully integrated system of ground-based optical/infrared telescopes spanning apertures from 4m to 8m in size.

**Figure 1. Organization Chart for the Full Consolidation Model.**



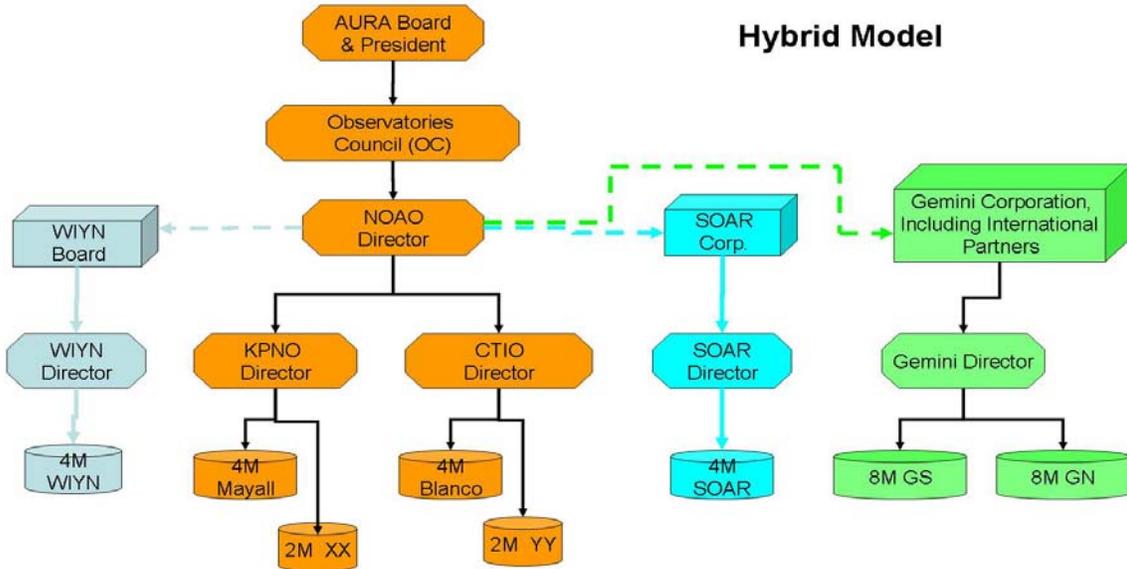
### 2. Hybrid Model

#### Synopsis

This model attempts to combine the facilities of NOAO with those of Gemini into a new observatory structure in what may be thought of as a partial or compromise consolidation model. In this model the basic NOAO governance remains unchanged while the Gemini 8 m telescopes

at the two sites remain part of a single, largely independent, observatory under the Gemini Corporation. This corporation is integrated with NOAO in a manner similar to the SOAR and WIYN corporations and is loosely connected with NOAO through the mechanism of having the NOAO Director sit on the Gemini Corporation Board. AURA manages the employees at both facilities. The degree of consolidation is similar to that of SOAR and WIYN. A critical element of this model is that US funding for Gemini would flow through NOAO and then to Gemini similar to the existing situations with SOAR and WIYN in the current NOAO.

**Figure 2. Organization Chart for the Hybrid Model**



## Findings and Assessment of Options

The charge to the ACWG was to identify the consolidation model for merging the facilities of NOAO and Gemini that would best satisfy the recommendation of the most recent decadal survey (NWNH). The ACWG studied a number of different consolidation models and identified two viable options for the merging of NOAO with Gemini, into a new joint organization. Each model was found to be best applicable in a specific set of (differing) circumstances. Taking into account the needs and desires of all relevant parties (national and international) it appears that the primary factor for choosing among the models is the size of the U.S. share in the facility being merged (Gemini) with the existing national observatory (NOAO). The two models, the full consolidation model (FCM) and the hybrid model (HM) have existing successful analogs in the HST (NASA + ESA) partnership and the SOAR+WIYN+NOAO partnerships, respectively.

The hybrid model is most appropriate when the U.S. federal share in the facility being merged is not a majority share. For example in the cases of SOAR and WIYN the U.S. federal (NOAO) shares are 30% and 40% respectively. In these situations the governance structure appears to function well when it consists of a governing or corporate board on which the US (NOAO) sits as a peer member and when there is a good working relationship characterized by full trust and cooperation among partners. The full consolidation model is most appropriate when the US federal share in the facility is the clearly dominant share. This is the case for the HST, where the US (NASA) share is 85%. Here, establishing a governing board of peer-partners is inappropriate.

After the departure of the UK from the Gemini partnership, the US will effectively have a 65-67% federal share in the facility. The critical issue is whether for a share level of this size the FCM or HM model is most appropriate. The ACWG concluded that the FCM is most appropriate for this situation.

In its recommendation to consolidate the operations of NOAO and Gemini "...to both maximize cost-effectiveness and to be more responsive to the needs of the U.S. astronomical community", the NWNH decadal survey recognized a long-standing dissatisfaction with the Gemini Observatory within the U.S. community. A measure of the depth of this dissatisfaction can be found in the most recent NOAO Users Committee (UC) report which states: "...the UC continues to be deeply concerned about the scientific productivity of the U.S. investment in the Gemini Observatory and the degree to which it meets the U.S. community needs for 8-m class telescope access", and "...the Gemini Observatory may need to implement profound and radical changes in its operation in order to engage the U.S. user community."

The full consolidation model is the only option that fully satisfies the decadal survey recommendation of merging NOAO and Gemini into a single operational structure. By producing a fully integrated system of US national telescopes, it optimizes scientific productivity through sharing of technical support and resources. The product of a full consolidation model would be a stronger national observatory for the US community, one that can compete head-to-head with ESO. The hybrid model offers no such advantage. For these reasons and the fact that the US share in Gemini will increase to 65-67% with the departure of the UK, the ACWG favors the adoption of this model for the consolidation of NOAO and Gemini.

Although there is a risk that some of the international Gemini partners may not want to participate in a full consolidation observatory model, a counterpoint is that participating in such a consolidated observatory might be *more* attractive to these partners. In particular, an arrangement that provided equal access to the various components of the US OIR System, including access to the DES and BigBOSS projects and eventually LSST data, might be appealing to the astronomical communities of at least some of the international partners. In a consolidated observatory the 8m telescopes still provide attractive platforms for instrument development by the international partners. Moreover, there is every reason to expect that full consolidation will lead to the development of a suite of instruments for the Gemini telescopes that better meets the needs of all user communities. This, coupled with improvements in operations, should make it easier to obtain scientifically useful data with these telescopes and result in an observatory that is more productive and thereby attractive to both the U.S. and international partners.

The ACWG was aware that as part of this assessment process it is important to be cognizant of what is best *both* for the future of the Gemini observatory and for the future health of the U.S. National Observatory. There is some concern that in a full consolidation observatory support for 4m telescopes could be significantly reduced in order to maintain adequate support for the 8m facilities in an era of constrained or declining NSF budgets. However, it must be recognized that the current situation, wherein the U.S. National Observatory is solely responsible for the operations of only of two 4m telescopes plus holds only 30-40% shares of two other 4m telescopes, is unlikely to be viable or competitive in the long term. A fully consolidated National Observatory affords a better chance of keeping one or more of the 4m telescopes running since it

is the only model that offers the possibility of both optimizing and coordinating NSF funds for the facilities presently operated by both NOAO and Gemini. In a full consolidation model, Gemini's direction will more directly align with that of the U.S. astronomical community, thereby strengthening the U.S. National Observatory and enabling it to both better respond to the needs of the U.S. optical and infrared communities and better manage vital astronomical resources in an era of difficult budgetary and scientific challenges.

### **Concluding Remarks**

The AURA Board accepted the ACWG report in September 2011 and endorsed its findings and conclusion that a full consolidation model represents the best solution for merging Gemini and NOAO into a single, effective operational structure. The AURA Board resolved to proceed with the process of further developing and eventually implementing the full consolidation option after first soliciting and considering input from the astronomical community. The Board-approved ACWG report was offered first to NSF for examination and comment before being publically posted to the AURA web site on 2011 Nov 29. Comments were solicited from the community, both on that web page, and via appeals through AURA member universities and other routes. As of this writing (2012 Jan 25), a total of 31 sets of comments have been received and posted (another 8-10 sets were offered privately, and so are not posted).

Surprisingly, no one commented on the Hybrid Model. Also, there were no comments either for or against the Full Corporate model, which appeared in the report appendix.

Comments were restricted to the Full Consolidation Model and tended to be either strongly in favor of the model or strongly against. Most, but not all, of the bifurcation of opinions follows national lines –the majority of U.S. respondents favored the FCM, the majority of non-U.S. respondents did not. Some in the U.S. commented negatively on the FCM, though they were a minority of U.S. respondents.

Consolidation of Gemini and NOAO is a topic for which many opinions exist. Gemini governance is a related, intertwined topic that also generates great interest. Several of the offered comments fault the ACWG for failing to supply cost estimates for the gains each model would bring, but producing such estimates was outside the remit of the committee. Others confuse poor Gemini performance with weak Gemini governance and target AURA, but without understanding the tight restraints imposed on AURA by the Gemini International Agreement.

If we are to 'solve' the 'Gemini problem' and the proliferation of U.S. national ground-based OIR observatories, one for each aperture range, consolidation under some model will surely occur. Doing so now, or in the very near future, permits negotiating new partnership agreements, access, and governance well before the 2015 end of the current Gemini International Agreement.

It is not just about cost. It is not just about governance. It is not as simple as reneging on international partnerships. It is about facing up to the need for more coherent organization and operation of our national ground-based OIR facilities. Who will lead the way along the path to necessary change? The AURA Board has acted precisely because this question has remained unanswered for far too long, and we look to the attention and insight of the Portfolio Review Panel to help light the way forward.