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PUBLIC MEETING ON THE DRAFT  
ENVIRONMENTAL IMPACT STATEMENT  
IN ARECIBO, PUERTO RICO

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held on Wednesday, November 16, 2016, at the College of  
Engineers and Surveyors, Manuel T. Gillán Avenue,  
Arecibo, Puerto Rico, beginning at 6:15 p.m.

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IN ARECIBO, PUERTO RICO  
WEDNESDAY, NOVEMBER 16, 2016  
PROCEEDINGS

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MS. HAMILTON: Good evening. The meeting will begin shortly. If everybody could take their seats, please. Thank you.

MR. GAUME: Thank you for coming tonight. In case you're at the wrong meeting, this is the public meeting on the Draft Environmental Impact Statement for the Observatory Arecibo.

I have a brief presentation this evening. But first I will be introducing the team members and will describe the materials that we have. We'll talk about the purpose of the meeting. We'll talk about the Draft Environmental Impact Statement, a summary. And then we'll turn it over to you guys to provide us with your comments. If you haven't already signed up to speak and you would like to speak, please do so now, right over here.

So I would like to do the introductions now. My name is Ralph Gaume

1 and I'm the Arecibo Observatory Program  
2 director for the National Science  
3 Foundation. This is Caroline Blanco,  
4 assistant general counsel for NSF. This is  
5 Kristen Hamilton, the Environmental  
6 Compliance officer for NSF. The person  
7 with the green laser dot on her vest is Ivy  
8 Kupec, our Public Affairs specialist. And  
9 that's Karen Pearce, our senior Legislative  
10 Affairs specialist for the National Science  
11 Foundation.

12 CH2M Hill is providing contractor  
13 support to NSF for preparation of the EIS.  
14 And sitting at the back table is Lori  
15 Price. She is our Cultural Resources lead.  
16 And sitting at Lori's left is Richard  
17 Reaves, Ecology and NEPA lead. In  
18 addition, I should mention that NASA is  
19 serving as a cooperating agency for this  
20 EIS.

21 So the materials which you can review  
22 here or take home with you are the fact  
23 sheets and information boards. This  
24 presentation, the electronic version of the  
25 fact sheets, and the information boards

1 will be posted on this website,  
2 [www.nsf.gov/AST](http://www.nsf.gov/AST), sometime soon after public  
3 meetings.

4 So the National Science Foundation has  
5 prepared a Draft Environmental Impact  
6 Statement to evaluate potential  
7 environmental impacts of the proposed  
8 operational changes due to funding  
9 constraints for Arecibo Observatory. The  
10 Draft Environmental Impact Statement was  
11 noticed in the Federal Register, emailed to  
12 our stakeholder list, and posted to our  
13 website on October 28.

14 The purpose of this meeting is to  
15 allow for public comments on the DEIS which  
16 will help us put together the Final  
17 Environmental Statement. It would be  
18 helpful for your comments to be as specific  
19 as possible; and, of course, we welcome any  
20 comments on the Draft Environmental Impact  
21 Statement that you may wish to provide. In  
22 addition, a Section 106 consultation  
23 meeting will be held tomorrow at 1:00 p.m.

24 The purpose of the proposed action is  
25 to substantially reduce NSF's contribution

1 to the funding of Arecibo Observatory. NSF  
2 needs to maintain a balanced research  
3 portfolio with the largest scientific  
4 return for the taxpayer dollar. The  
5 scientific community, through reviews and  
6 surveys, has indicated that the scientific  
7 capability of Arecibo Observatory is lower  
8 in priority than other scientific  
9 capabilities that NSF funds. So I would  
10 ask you to please see the Executive Summary  
11 of the DEIS on Section 1 for a full  
12 background and an explanation of why the  
13 NSF is proposing these changes.

14 So in 2012 the National Science  
15 Foundation -- the Division of Astronomical  
16 Sciences Portfolio Review Committee was  
17 formed as a subcommittee of the Advisory  
18 Committee, the NSF director of Mathematical  
19 and Physical Sciences. The Portfolio  
20 Review Committee was subject to the  
21 regulations pertaining to the Federal  
22 Advisory Committee Act.

23 With regards to Arecibo Observatory  
24 this report said that AST should reevaluate  
25 its participation in Arecibo and SOAR later

1 in the decade, in light of the science  
2 opportunities and budgets forecasts and  
3 that time. If funding remains tight later  
4 in the decade, then, the scientific need  
5 for continued AST funding for Arecibo and  
6 SOAR must be weighed against the needs of  
7 the grants program.

8 The reevaluation discussed here began  
9 with a Dear Colleague Letter on October  
10 2015, which requested viable concepts for  
11 the future of Arecibo Observatory,  
12 specifically including strategies and goals  
13 for continued operations that involve a  
14 substantially reduced funding commitment  
15 from NSF. In addition, in 2015 the NSF  
16 Division of Atmospheric and Geospace  
17 Sciences performed a portfolio review  
18 committee as a subcommittee of the Advisory  
19 Committee of the National Sciences  
20 Foundation Directorate for Geosciences.

21 Like the Astronomical Sciences  
22 Portfolio Review Committee, the Atmospheric  
23 and Geospace Sciences Portfolio Review  
24 Committee was subject to regulations  
25 pertaining to the Federal Advisory

1 Committee Act. This Portfolio Review  
2 Committee recommended the reduction of  
3 atmospheric and geospace sciences annual  
4 funding for Arecibo from 4.1 million per  
5 year in 2016 to 1.1 million per year 2020.  
6 The Atmospheric and Geospace Sciences  
7 Portfolio Review was accepted by the  
8 Geosciences Directorate Advisory Committee,  
9 in April 2016, and is currently being  
10 assessed by the National Academies  
11 Committee. At this time, NSF has made no  
12 determination to act upon this  
13 recommendation.

14 Every 10 years the National Academies  
15 has undertaken a decadal survey that  
16 recommends scientifically important  
17 projects that NSF, NASA, and the Department  
18 of Energy should undertake in the next  
19 decade. The last astronomy decadal survey  
20 was published in 2010 and was called "New  
21 Worlds, New Horizons in Astronomy and  
22 Astrophysics."

23 Recently, the National Academies  
24 formed a committee to review progress  
25 toward the decadal survey vision. In

1 August 2016, this committee reported that  
2 the NSF should proceed with divestment from  
3 ground-based facilities that have a lower  
4 scientific impact, implementing the  
5 recommendations of the NSF Portfolio  
6 Review, which is essential to sustaining  
7 the scientific vitality of U.S.  
8 Ground-based Astronomy Program as new  
9 facilities come into operation.

10 One final committee report which I'll  
11 mention is the Astronomy and Astrophysics  
12 Advisory Committee. It's a committee  
13 formed by Congress in 2002. Again, they  
14 review NSF, NASA, and the Department of  
15 Energy's astrophysics programs. Annually,  
16 the Astronomy and Astrophysics Advisory  
17 Committee sends reports on NSF, NASA, and  
18 Department of Energy astronomy and  
19 astrophysics programs to several  
20 congressional science-related committees  
21 both in the House of Representatives and  
22 the Senate.

23 In their report this year the  
24 Committee stated, "Strong efforts by NSF  
25 for facility divestment should continue as



1 fast as is practical. Efforts to explore  
2 partnerships, interagency cooperation, and  
3 private resources to maintain some access  
4 to facilities for the U.S. community that  
5 may mitigate the loss of open access should  
6 continue. Transferring the cost of  
7 operating a facility outside of the NSF/AST  
8 budget is preferable to complete loss of a  
9 capability from the suite of capabilities  
10 used by U.S. researchers."

11 As we presented during the scoping  
12 period, several alternatives were  
13 identified that can meet the purpose of  
14 substantially reduce NSF's funding. Those  
15 are following: the collaboration with  
16 interested parties for continued  
17 science-focused operations; the  
18 collaboration with interested parties for  
19 transition to education-focused operations;  
20 mothballing of facilities, and note that  
21 "mothballing" could mean suspension of  
22 operations in a manner such that operations  
23 could resume efficiently at a future date;  
24 full deconstruction and site restoration;  
25 partial deconstruction and site

1 restoration; and no action, which is  
2 continued NSF investment for  
3 science-focused operations.

4 With regards to Alternative 4,  
5 "Partial Deconstruction and Site  
6 Restoration" -- Alternative 4 involves the  
7 deconstruction of all above-grade  
8 structures, except for large, concrete  
9 structures; that is the towers, tower and  
10 catwalk anchors, and rim wall  
11 infrastructure. All below-grade  
12 foundations would be stabilized and filled  
13 in.

14 NSF's preferred alternative, as  
15 identified in the Draft Environmental  
16 Impact Statement, is Alternative 1:  
17 "Collaboration with Interested Parties for  
18 Transition to Science-focused Operations."  
19 This alternative will meet the purpose and  
20 need of reducing the funding required for  
21 NSF while allowing continued benefits to  
22 the scientific and educational communities.  
23 However, Alternative 1 can only be  
24 implemented if new stakeholders come  
25 forward to participate as collaborating

1 parties with viable proposed plans to  
2 provide additional non-NSF funding in  
3 support of their science-focused  
4 operations.

5 Note that for each proposed  
6 alternative NSF has identified which  
7 buildings and infrastructure would be  
8 retained, deconstructed, mothballed, or  
9 safe abandoned. This level of detail is  
10 helpful in ensuring the environmental  
11 impact analysis and adequately addresses  
12 each proposed alternative.

13 In October 2015, NSF issued a Dear  
14 Colleague Letter requesting viable concepts  
15 for future continued operations of Arecibo  
16 Observatory. In part, NSF utilized the  
17 responses received to inform which  
18 buildings and infrastructure will be  
19 included for study in the EIS. As I said,  
20 "In part NSF utilized these responses to  
21 inform which buildings and infrastructure  
22 will be included." The Dear Colleague  
23 Letter did not limit the responders or  
24 direct the responders to a specific  
25 solution but allowed the responders to

1 propose innovative and operational models  
2 that may require some subset of the  
3 existing buildings and infrastructure.

4 As we move forward with the EIS  
5 process, it is possible that a subset of  
6 the buildings and infrastructure identified  
7 in the DEIS under Alternative 1 and 2 could  
8 be retained, deconstructed, mothballed, or  
9 safe abandoned.

10 I believe that Caroline Blanco has  
11 some additional words that she wanted to  
12 add to this slide.

13 MS. BLANCO: Thank you, Ralph. Good  
14 evening everybody.

15 The number of structures and  
16 infrastructure for Alternatives 1 and 2  
17 represent the most inclusive scenarios.  
18 But, as Ralph mentioned, it might be that a  
19 smaller subset is ultimately selected.

20 We analyzed the most inclusive  
21 scenario so that we can understand the full  
22 scope of environmental impacts anticipated.  
23 This way we have already analyzed the most  
24 inclusive scenario of impacts and any  
25 reduction in infrastructure and structures

1 would be a lesser included universe of  
2 impacts analyzed.

3 This slide provides information on the  
4 scoping process that occurred late last  
5 spring. The meeting materials and  
6 transcripts of those scoping meetings are  
7 available on our website. Over 80  
8 attendees participated in the two scoping  
9 meetings and 240 comments were submitted to  
10 NSF. The comments are addressed in  
11 Section 5 of the Draft EIS.

12 The contents of the Draft EIS are the  
13 following. The first part is the Executive  
14 Summary, which provides a concise summary  
15 of approximately 26 pages out of 272 of the  
16 Draft EIS, and includes all the findings.  
17 It is provided in the website in both  
18 English and Spanish. The second section is  
19 the Purpose and Needs Section, and that  
20 provides the rationale for NSF's proposed  
21 action.

22 The next section provides a full  
23 description of each of the proposed  
24 alternatives, including which buildings or  
25 structures would remain under each

1 alternative. Then the document moves on to  
2 the Affected Environment Section, which  
3 provides an overview of the existing  
4 physical, biological, economic, and social  
5 conditions at Arecibo Observatory.

6 The next section is the Environmental  
7 Consequences Section, which provides an  
8 evaluation of the potential environmental  
9 impacts of the proposed action under each  
10 of the five alternatives; and then the  
11 no-action alternative. The impacts of each  
12 alternative's implementation and operations  
13 are assessed. In addition, mitigation  
14 measures to reduce the duration, intensity,  
15 or scale of the impacts are identified.

16 The final section of the Draft EIS  
17 provides information on the process thus  
18 far and a summary of the consultation that  
19 has occurred to inform the Draft  
20 Environmental Impact Statement.

21 Under "Impact Analyses," it includes  
22 impacts of ecological, aesthetic, historic,  
23 cultural, economic, social, or health; and  
24 also indicates whether they can be  
25 beneficial or adverse. Wherever possible

1 in the Draft EIS, the type of impact,  
2 direct, indirect, or cumulative; the  
3 duration, whether short-term or long-term;  
4 the intensity, whether negligible or minor,  
5 moderate, or major; and the scale, whether  
6 it's local or regional are analyzed for any  
7 potential impacts.

8 Direct impacts are those caused by the  
9 action and occur at the same time and  
10 place. Indirect impacts are those that are  
11 caused by the action and are later in time  
12 or farther removed in distance but still  
13 reasonably known. Cumulative impacts are  
14 those that can result from individually  
15 minor; but, when added to past, present,  
16 and reasonable foreseeable impacts, we take  
17 a look at whether those actions then become  
18 major over time.

19 The resource areas that were  
20 considered in the Draft EIS include the  
21 following: biological resources, cultural  
22 resources, geological resources;  
23 groundwater, hazardous, and solid wastes;  
24 health and safety; noise; socioeconomics;  
25 traffic; visual resources; and

1 environmental justice issues.

2 The Draft Environmental Impact  
3 Statement is available in the NSF website  
4 and in local libraries. In addition, as  
5 Ralph mentioned, the Executive Summary is  
6 available in Spanish and can also be found  
7 on our website. The copies that are at the  
8 local libraries are hard copies.

9 We are now in the middle of the  
10 45-day-public comment period on the Draft  
11 Environmental Impact Statement. There are  
12 a couple of ways to provide public comments  
13 and we encourage you to do so. One is  
14 through providing verbal comments at this  
15 meeting. The other is by providing written  
16 comments, either emailed or mailed; and  
17 those will be accepted until December 12,  
18 2016. The address to submit comments  
19 through email or written comments by mail  
20 are included at the bottom of the slide.

21 Looking forward, there are target  
22 dates for the process. The first is the  
23 scoping period that has already concluded.  
24 There was a 30-day-comment period and  
25 public meetings. That public-comment



1 period helped to inform the preparation of  
2 the Draft EIS. As I mentioned, that began,  
3 once it was published, a 45-day-public  
4 comment period and public meetings, both  
5 tonight and tomorrow morning from 10:00 to  
6 12:00 in San Juan.

7 Again, the public-comment period will  
8 conclude on December 12, 2016. Then we  
9 will take those comments, review them,  
10 consider them, and prepare the Final  
11 Environmental Impact Statement. We  
12 anticipate the release of the Final  
13 Environmental Impact Statement sometime  
14 around or on May of 2017. And then, at  
15 least 30 days later, it could be longer, we  
16 will prepare and issue a Record of  
17 Decision. That is anticipated in the  
18 summer of 2017. That decision will include  
19 reasoning based on environmental impacts,  
20 budget issues, science priorities, and  
21 other factors.

22 And the solicitation that Ralph  
23 mentioned earlier for collaboration will be  
24 going on in parallel to this environmental  
25 review. And also, at the bottom of the

1 slide, you will see two other environmental  
2 compliance processes: the National  
3 Historic Preservation Act and the  
4 Endangered Species Act. And as we  
5 mentioned earlier, a Section 106  
6 consultation meeting under the National  
7 Historic Preservation Act will take place  
8 tomorrow at the Doubletree Hotel, in San  
9 Juan, from 1:00 to 2:00. People who  
10 expressed an interest in participating as  
11 consulting parties already are aware of  
12 this, and the public is also invited. As I  
13 mentioned, the Record of Decision includes  
14 a variety of factors that I mentioned  
15 earlier.

16 And now we turn to the public-comment  
17 period, oral-comments period of this  
18 meeting. We would ask that we have one  
19 speaker at a time that will be called up by  
20 Kristen Hamilton. When your name is  
21 called, Karen Pierce -- well, please stand  
22 up, state your name and spell your name for  
23 the court reporter, and Karen Pearce will  
24 bring the microphone to you so that you can  
25 provide your comment.

1           This is a good time to mention that  
2           these proceedings are going to be  
3           transcribed by a court reporter and, when  
4           available, the transcript will be posted on  
5           the website. When you do provide your  
6           public comments, please direct them only  
7           to -- please, understand that the NSF is  
8           not going to be addressing your comments at  
9           this time, but they will be addressed in  
10          the Final EIS. And please direct your  
11          comments and questions to the contents of  
12          the DEIS.

13           Also, given the number of speakers and  
14          to give everyone an opportunity to provide  
15          their verbal comments, we will limit the  
16          time per comment, including time for  
17          translation, initially to three minutes.

18           Because it can often be difficult for  
19          a speaker to know how long he or she has  
20          been speaking, Kristen Hamilton will stand  
21          up at the two-minute mark so that the  
22          speaker will know when to begin to wrap up  
23          his or her comments. If we have time left  
24          over after everyone has had a chance to  
25          speak, we will allow an additional

1 opportunity for additional comments. Also,  
2 please remember that you still have an  
3 opportunity to provide any comments up  
4 until December 12 by email or by regular  
5 mail.

6 Thank you very much for your  
7 participation. We do value your comments  
8 and do encourage you to provide them.  
9 Thank you very much.

10 Now Kristen will call each speaker in  
11 the order they signed up.

12 MS. HAMILTON: Thank you. And my  
13 colleague Karen will help to pass the  
14 microphone around.

15 First up is Francisco Córdova.

16 MR. CÓRDOVA: Thank you. I will not  
17 need translation today. I have them both  
18 in Spanish and English, all written  
19 continuously.

20 MS. HAMILTON: Okay.

21 MR. CÓRDOVA: Thank you.

22 My name is Francisco Córdova. I'm the  
23 director of the Arecibo Observatory and of  
24 SRI International. This statement reflects  
25 the views of SRI International and the

1       Arecibo Observatory management team,  
2       composed of SRI International, University  
3       Space Research Association and Universidad  
4       Metropolitana.

5               The Arecibo Observatory has been a  
6       critical scientific site for over 53 years,  
7       performing cutting-edge research in the  
8       areas of radio astronomy, space and  
9       atmospheric sciences, and planetary  
10       sciences. It currently plays a vital role  
11       in the study of potentially hazardous  
12       asteroids, studying space weather and  
13       enabling discoveries that help humanity  
14       better understand the universe. It is also  
15       a key facility for science, technology,  
16       engineering and math education, hosting  
17       over 90 thousand visitors every year, the  
18       majority of which are minority students  
19       local to Puerto Rico.

20               It has been clearly communicated by  
21       NSF that severe internal financial pressure  
22       is driving the Agency to reduce funding for  
23       various large facilities, Arecibo being one  
24       of them. While we may disagree on the need  
25       to divest in Arecibo based on the

1 uniqueness of the site and the remarkable  
2 scientific and educational accomplishments,  
3 we have been focused on helping NSF find  
4 suitable solutions that will provide  
5 long-term financial stability for the  
6 Arecibo site, and today we reiterate our  
7 commitment in providing that support.

8 In the published DEIS, NSF identified  
9 Alternative 1, "Collaboration with  
10 Interested Parties for Continued  
11 Science-focused Operations," as the  
12 Agency-preferred Alternative. The AMT,  
13 Arecibo Management Team, is optimistic  
14 about NSF wanting to continue  
15 science-focused operations at the Arecibo  
16 Observatory. However, we are concerned by  
17 the details behind NSF's proposed  
18 alternative, in particular the  
19 deconstruction of over 26 buildings at the  
20 site and the implied elimination of the  
21 planetary radar and the space and  
22 atmospheric science capabilities at  
23 Arecibo.

24 The DEIS states, and I quote, that  
25 "Alternative 1 would meet the purpose and

1 need of reducing the funding required from  
2 NSF." However, nowhere in the document has  
3 this financial analysis been presented nor  
4 has it been clearly communicated why or how  
5 the deconstruction of critical elements of  
6 the Observatory is of financial benefit to  
7 NSF. It certainly did not come from the  
8 Arecibo Management Team.

9 A rationale for how and why these  
10 specific buildings were selected for  
11 deconstruction should also be included. A  
12 thorough financial analysis outlining the  
13 exact maintenance and operational costs for  
14 each of the buildings also needs to be  
15 performed and included in the document as  
16 data.

17 It is also puzzling that while the NSF  
18 wants interested parties to collaborate and  
19 financially support the Arecibo  
20 Observatory, NSF proposes the elimination  
21 of the very elements that differentiate  
22 Arecibo from other sites around the world:  
23 the radar and space weather capabilities.

24 To provide an example, more than 15  
25 million NSF dollars have been spent over

1 the past 10 years in the development and  
2 commissioning of a heating facility in  
3 support of space and atmospheric sciences.  
4 Yet, under the DEIS, NSF recommends its  
5 deconstruction. The heating facility was  
6 explicitly requested by the scientific  
7 community, has potential to become  
8 revenue-generating, and was just  
9 commissioned less than three weeks ago.

10 Similarly, approximately one third of  
11 the current operating budget for Arecibo is  
12 provided by NASA, solely for the use of the  
13 planetary radar capabilities and the  
14 studies of near-Earth objects. This is  
15 another unique equipment which is being  
16 deconstructed under Alternative 1.

17 The following quote talks about the  
18 role of studying NEOs as a public health  
19 resource: "This improved characterization  
20 and tracking has an impact on public safety  
21 only if there is a means of deflecting or  
22 disrupting objects on a collision course  
23 with Earth, which would be completely  
24 independent of the Arecibo Observatory.  
25 The U.S. Government currently does not have



1 such capability."

2 This logic is similar to saying that  
3 the human race should stop studying the  
4 disease of cancer because we have no way to  
5 cure it or that we should stop looking for  
6 other galaxies because we have no way to  
7 reach them. It is the very essence of  
8 research to dive into the unknown, to  
9 accomplish what have never been  
10 accomplished before in order to make our  
11 world a better one.

12 A written statement will also be  
13 provided by the Arecibo Management Team  
14 outlining multiple inconsistencies found in  
15 the DEIS document, which I will not discuss  
16 verbally.

17 We reiterate our support for all three  
18 scientific areas, planetary sciences, radio  
19 astronomy, and space and atmospheric  
20 sciences to continue operations at the  
21 site. We believe these capabilities make  
22 Arecibo more marketable and better prepared  
23 for a future with reduced NSF funding.

24 We will continue to collaborate with  
25 NSF as much as possible in an effort to

1 ensure the future of the Arecibo  
2 Observatory and to maintain the prestige  
3 and recognition this institution has held  
4 for over 50 years.

5 My three minutes aren't up. Would you  
6 like me to go ahead and do it in Spanish?

7 (Whereupon, Mr. Córdoba reads his  
8 comments in Spanish.)

9 MS. HAMILTON: Thank you.

10 Francisco gets a free pass for being  
11 the first one. But from now on I think we  
12 need to keep it to three minutes with both  
13 English and Spanish. The reason is that we  
14 are currently delayed with the number of  
15 speakers we have signed up. We're already  
16 delayed to be 20 to 30 minutes passed 8:00,  
17 which is when the scheduled end-time is.

18 So, if you have a letter to read, I  
19 would encourage you to mention the  
20 pertinent points and then submit the letter  
21 as your comment. It would be considered.

22 Thank you. We appreciate your  
23 understanding.

24 The next speaker is Nicholas White.

25 MR. WHITE: Thank you. I will also

1 provide translation. So we don't need the  
2 translator.

3 My name is Nicholas White. I'm the  
4 Universities Space Research Association  
5 senior vice-president for Science. USRA is  
6 a non-profit organization with a 105  
7 universities granting PhDs in Space  
8 Science, and we are one of the three  
9 managing partners of the Observatory.

10 I'm going to focus my comments on the  
11 planetary radar, which the Draft EIS  
12 incorrectly summarizes the safety hazard.

13 You may have read in the newspapers  
14 last month that NASA, the Federal Emergency  
15 Management Agency, and other government  
16 agencies engaged in a planetary protection  
17 exercise of the NASA jet propulsion lab to  
18 consider the potentially devastating  
19 consequences of a 330-foot asteroid hitting  
20 the Earth.

21 While this may seem like science  
22 fiction, these events are a real  
23 possibility. One just has to remember the  
24 2013 Chelyabinsk impact in Russia, which  
25 was caused by an object only 20 meters

1 across. Despite its small size, it caused  
2 damage to 7,200 buildings and injured 1,500  
3 people.

4 How is this relevant to the discussion  
5 today? Well, Arecibo Observatory is the  
6 world's most powerful and sensitive radar  
7 system which is used to track these killer  
8 objects. It is a vital part of our  
9 planetary defense system. These objects  
10 are found by optical telescopes that scan  
11 the sky, looking for moving points of  
12 light. Once an asteroid is found, Arecibo  
13 Observatory is, within days, turning its  
14 radar to pin-point its orbit.

15 Arecibo Observatory determines to  
16 better than 1 part in 10 million the path  
17 of the asteroid and whether it will or will  
18 not hit the Earth at some point in the  
19 future. Such is the precision Arecibo  
20 Observatory can predict the asteroid orbit  
21 decades, even centuries, into the future.  
22 The earlier we find one of these killer  
23 asteroids the more time there is to deal  
24 with it.

25 Many of these asteroids may go on to

1 orbit the sun for decades before their  
2 paths cross the Earth. In these cases we  
3 will have time to send spacecraft to  
4 deflect well ahead. Even in the worst case  
5 scenario, where the asteroid is already on  
6 a direct collision course, Arecibo  
7 Observatory allows us to predict the time  
8 and place of its impact and take action to  
9 save lives.

10 The criticality of the Observatory has  
11 been recognized by the National Academy of  
12 Sciences. In a report in 2010, the Academy  
13 recommended immediate actions required to  
14 ensure the continued operation of the  
15 Arecibo Observatory at a level sufficient  
16 to maintain it and the staff of the  
17 facility, and that is a source of the NASA  
18 funding for one third of the total funding  
19 of the Observatory.

20 In 2005 the United States Congress  
21 passed the George E. Brown, Jr. Act that  
22 directed NASA to detect, track, and  
23 characterize near-Earth objects. This went  
24 on to a second goal, which incorporated the  
25 National Space Policy of the United States

1 of America that guides the NASA  
2 administrators to pursue capabilities in  
3 cooperation with other departments and  
4 other agencies and commercial partners to  
5 detect these asteroids.

6 Shutting down the planetary radar  
7 operations of Arecibo Observatory will put  
8 lives and properties at risk. NSF is the  
9 federal steward for this facility, and it's  
10 USRA's expectation that NSF will maintain  
11 this national need to track and  
12 characterize near-Earth asteroids. The  
13 DEIS fails to note all these critical  
14 facts, and USRA requests that it be  
15 corrected.

16 I would like to end by saying that the  
17 USRA, along with our partners, SRI and  
18 UMET, remain committed to maintain the full  
19 operation of the site. As part of this,  
20 we're seeking all interested parties to  
21 utilize the scientific assets or the site  
22 itself to ensure that the NSF's preferred  
23 option can be realized.

24 I will pass it now for the  
25 translation.

1           (Whereupon, an audience member reads  
2           in Spanish Mr. White's comments.)

3           MS. BLANCO: Folks, if you  
4           really -- we are really going to do our  
5           best to try to stay as late as we can. But  
6           please, please give everybody else an  
7           opportunity to speak as well.

8           We'd appreciate if you keep your  
9           comments to three minutes, including the  
10          translation. If you have a written  
11          comment, you can provide it to the  
12          translator; and as soon as you're done  
13          reading it, he can translate it. In the  
14          alternative, if you just provide your oral  
15          comment, please provide enough breaks so  
16          that he can translate.

17          Thank you.

18          MS. HAMILTON: Carlos Padín.

19          MR. CÓRDOVA: Carlos couldn't make it  
20          today. We'll present his comments  
21          tomorrow.

22          MS. HAMILTON: Tony Van Eyken.

23          MR. VAN EYKEN: In the interest of  
24          making sure that we get out of here  
25          tonight, I'll make my comments in writing.

1 MS. HAMILTON: Good point. I just  
2 wanted to make the point that everybody's  
3 comments, whether they are verbal or  
4 written, will be considered the same, in  
5 the same way.

6 José Menéndez. Oh, my apologies.  
7 Edgard Rivera. If it's okay with Edgard,  
8 we'll have John Kelly go next. He was next  
9 in line but wasn't --

10 MR. KELLY: Thank you.

11 We do welcome the opportunity to  
12 provide comments on NSF's Draft  
13 Environmental Impact Statement and we  
14 believe that we can provide important  
15 perspectives that should be included in the  
16 final version. Nevertheless, we will also  
17 provide written comments within the period.

18 The first and most important point is  
19 that the Draft EIS does not cover the  
20 specific scenario of operational changes  
21 that we describe in our response to NSF's  
22 Dear Colleague Letter. That scenario, DEIS  
23 notwithstanding, is the one we consider the  
24 most desirable, most practical, and most  
25 likely to be successful. That scenario was



1 first described to NSF four years ago. It  
2 is entirely viable, addresses NSF's needs,  
3 and it is well known throughout the  
4 community and at NFS itself. Instead, the  
5 Draft EIS considers, and NSF has adopted as  
6 the Agency's preferred solution, a scenario  
7 so unlikely as to render the whole result  
8 not relevant.

9 The NASA requirement already mentioned  
10 absolutely requires a continuation of the  
11 Observatory's globally unique planetary  
12 radar. Every scenario in the future  
13 assumes that the NASA involvement  
14 continues. Yet the Agency's preferred  
15 option includes the demolition of that  
16 radar's power supply without which there  
17 would be no planetary radar at all, which  
18 brings me to the second point.

19 The NSF has announced in a further  
20 Dear Colleague Letter its intention to  
21 solicit proposals for the future operation  
22 of the Arecibo Observatory and to require  
23 those inputs before the Final EIS is  
24 published and before deciding and  
25 publishing the Record of Decision. This

1 improper order of events suggests that  
2 potential solicitation will require  
3 proposers to bid on an unknown.

4 Formal requirements for a Record of  
5 Decision require that an EIS has been  
6 prepared for all considered alternatives.  
7 So either there is something unsuitable  
8 with the time order -- clearly there is  
9 something unsuitable with the time order  
10 here. Either the Record of Decision should  
11 precede the solicitation to the proposal or  
12 the proposal should be collected before the  
13 EIS was undertaken. As it is, the only  
14 scenarios considered in today's DEIS appear  
15 to be qualified. And, as I have already  
16 said, that specifically excludes the  
17 current management teams' longstanding  
18 vision.

19 Thank you.

20 (Whereupon, an audience member reads  
21 in Spanish Mr. Van Eyken's comments.)

22 MS. HAMILTON: Edgard Rivera.

23 (Mr. Rivera reads his comment both in  
24 English and Spanish.)

25 MR. RIVERA: "Saludos." I am Edgard

1       Rivera-Valentín. I am a staff scientist at  
2       the Arecibo Observatory and a native of  
3       Arecibo, Puerto Rico. The following  
4       statement is my opinion and does not  
5       reflect the views of my employer.

6               The Draft Environmental Impact  
7       Statement, as released, suggests that  
8       buildings and infrastructure specifically  
9       related to planetary radar operations at  
10       the Arecibo Observatory will face  
11       demolition in NSF's favorite option. At  
12       the same time, the mothballing option would  
13       suggest that demolition of such buildings  
14       is not required, as the option exists to  
15       leave them as is.

16              I would like to remind the National  
17       Science Foundation of the various  
18       congressional and executive policies, acts  
19       and mandates related to the national  
20       capabilities for planetary defense. For  
21       example, the NASA Authorization Act of  
22       2008, which specifically calls for funding  
23       Arecibo and continue its operations,  
24       pending review by the National Research  
25       Council, which actually released a

1 statement the following year affirming the  
2 vital role Arecibo plays in planetary  
3 defense.

4 The Space Act Public Law 11-314 in  
5 2010 also specifically affirms the value of  
6 planetary radar on Section 71104. The  
7 National Space Policy of 2010, and in fact  
8 the NSF Act of 1950 Public Law 81-507,  
9 which sets forth the NSF mission, requests  
10 to secure the national defense. There is  
11 sufficient public policy on this.

12 By the NSF choosing to pursue  
13 deconstruction of the planetary radar  
14 capabilities of Arecibo Observatory rather  
15 than considering mothballing at worse, this  
16 act of choice by the NSF, which is the  
17 steward of Arecibo Observatory, can be  
18 construed as the NSF interfering in public  
19 policy that mandates the upkeep and  
20 operation of the planetary radar and the  
21 national abilities to precisely track  
22 asteroids.

23 I would strongly suggest the NSF to  
24 reconsider its demonstrated plans in the  
25 DEIS of deconstructing infrastructure

1 related to the Arecibo Observatory  
2 capabilities so that it maintains rather  
3 than interferes with public policy that has  
4 received historically bipartisan support.

5 Thank you.

6 MS. HAMILTON: Patrick Taylor.

7 MR. TAYLOR: My name is Patrick  
8 Taylor. I'm commenting on Section 4.7.1.1,  
9 "Operations under Alternative 1," the  
10 Agency-preferred Alternative.

11 The proposed destruction of the power  
12 supply building would result on the loss of  
13 at least 4 million dollars, a potential  
14 support from NASA, and would be an absurd  
15 action to take as part of a science-focused  
16 future for the Observatory.

17 There is a fallacy that because  
18 Arecibo only sees 30 percent of the sky  
19 that it cannot see the majority of  
20 asteroids. Asteroids are moving targets on  
21 the sky and can easily move in and out of  
22 Arecibo's field of view. In fact, an  
23 internal NASA study suggests Arecibo would  
24 see approximately 80 percent of potentially  
25 hazardous asteroids more than a year before

1 impact.

2 This flawed argument is further used  
3 incorrectly to claim that Arecibo is  
4 unlikely to see an impact in its field of  
5 view. Impacts are dismissed as having a  
6 negligible effect on public safety. Yes,  
7 impacts are low-probability, high-risk  
8 events. Yet the NASA Planetary Defense  
9 Coordination Office and the Federal  
10 Emergency Management Agency, FEMA,  
11 regularly carry up mock-asteroid-impact  
12 scenarios to practice disaster response.  
13 Similar scenarios involve the Space Mission  
14 Planning Advisory Group and the  
15 International Warning Network that are both  
16 sanctioned by the United Nations.

17 The risk of public safety from an  
18 asteroid impact is taken very seriously on  
19 an international level. Only imminent  
20 impacts are considered, for imminent  
21 impacts radar can lengthen the warning time  
22 prior to impact and significantly narrow  
23 the risk corridor. On the longer term,  
24 Arecibo Observatory is especially powerful  
25 for constraining possible impacts years or

1       decades in the future, famously seen in the  
2       case of asteroid Apophis.

3               Weighing the frequency of impacts  
4       against the lifetime of an observatory is  
5       completely irrelevant and only serves to  
6       obtain the desired result of a negligible  
7       effect on the public.

8               Finally, dismissing the threat of an  
9       asteroid impact because we lack an  
10       available deflection strategy is comparable  
11       to choosing to not study an infectious  
12       disease because we don't have yet the  
13       vaccine. It's incredibly naïve and  
14       short-sighted.

15              Thank you.

16              (Whereupon, an audience member reads  
17       in Spanish Mr. Taylor's comments.)

18              MS. HAMILTON: Next is Brett Isham.

19              MR. ISHAM: Hello. I'm Brett Isham  
20       from Interamerican University. Also, these  
21       comments are my own. I wanted to comment  
22       on the science justification mentioned in  
23       the DEIS.

24              In regard to the 2012 Astronomy  
25       Portfolio Review, it called for a science

1 reevaluation as well as a budget  
2 reevaluation later in the decade. I do not  
3 think a DCL is a new placement for the  
4 science reevaluation for the community.  
5 Besides the planetary radar -- I hope there  
6 would be someone here from NANOGrav. But  
7 also, in regard the 2015 AGS Portfolio  
8 Review, which is -- I guess the final  
9 results aren't in yet. But there were some  
10 serious errors. For example, there was a  
11 two-time error on the factor of two in the  
12 power of the planetary radar to its  
13 detriment.

14 Besides the science which speaks to  
15 the intellectual merit criteria of NSF,  
16 there is another criterion which NSF  
17 appears to weigh just as heavily, which is  
18 broader impact. I think the broader impact  
19 is mostly missing from the DEIS. So what  
20 better broader impact than an observatory  
21 located in the United States as opposed to  
22 one, for example, in the Andes.

23 In the case of Arecibo, 100 thousand  
24 visitors come per year to the Visitor  
25 Center, including 22 thousand students. I



1 think it might be fair, I could be wrong,  
2 that the Visitor Center is the best science  
3 museum in Puerto Rico, and 22 thousand  
4 students experience that each year. What  
5 would be the message to children and people  
6 in Puerto Rico if we leave a dish as a  
7 monument to science abandoned? The message  
8 will be that science has abandoned Puerto  
9 Rico, that science is not a valuable tool.

10 So the Arecibo Observatory has other  
11 broader impact activities, such as the  
12 Saturday Academy, the Space Academy,  
13 teacher training, and several things like  
14 that. What I would hope or wish for is  
15 that rather than new science badly argue  
16 for closing the Arecibo Observatory to use  
17 it well as an argument for finding  
18 solutions. Perhaps even within NSF some  
19 sharing of funding could be founded in  
20 Physics, which is spending 30 million a  
21 year on LIGO to search for gravitational  
22 waves, which can also be a project at  
23 Arecibo.

24 THE INTERPRETER: I'm sorry. Can you  
25 repeat that a little bit more clearly?

1           MR. ISHAM: I would hope that NSF put  
2           its efforts in a more positive direction,  
3           looking for solutions rather than trying to  
4           close the Arecibo Observatory. Perhaps,  
5           for example, sharing some funding with  
6           Physics, which is paying 30 million a year  
7           looking for gravitational waves, which  
8           Arecibo also has the possibility to  
9           observe.

10           One final comment, Arecibo has the  
11           possibility of looking at the lower  
12           atmosphere, which has been historically  
13           underexploited in part because of the lack  
14           of interest of the lower atmosphere vision.  
15           But I believe that science is good. That's  
16           another thing NSF could potentially look at  
17           internally.

18           THE INTERPRETER: That it's not  
19           sufficiently explored, and...?

20           MR. ISHAM: Another thing that could  
21           possibly be explored within NSF.

22           MS. HAMILTON: Andre Seymour.

23           MR. SEYMOUR: Hello. My name is  
24           Andrew Seymour, A-N-D-R-E-W-S-E-Y-M-O-U-R,  
25           for the record. We have our own

1 translation. She's right there, so we  
2 don't need -- so not to delay things  
3 longer.

4 The NSF as it produced this  
5 draft -- and I quote from this draft: "To  
6 analyze the potential environmental impacts  
7 associated with potential funding changes  
8 for the Arecibo Observatory." Sections  
9 3.1.5, "Threatened and Endangered Species,"  
10 and 3.1.6, "Migratory Birds," of this draft  
11 use the information for planning and  
12 conservation, also known as the IPAC Trust  
13 Report, as its sole reference to list the  
14 protected species known from Arecibo. Yet  
15 the IPAC Trust Report states multiple  
16 times, and I quote, "This IPAC Trust Report  
17 is for informational purposes only and  
18 should not be used for planning or analysis  
19 project-level impacts."

20 Since the IPAC Trust Report is not a  
21 proper study of the site and states it  
22 should not be used to analyze the impact  
23 level satisfactorily under Section 7 of the  
24 Endangered Species Act, all material based  
25 on the IPAC Report should be stricken from

1 the Environmental Impact Statement. Along  
2 with all this, sections in the Draft that  
3 refer to mitigation on migratory birds and  
4 threatened endangered species should be  
5 reevaluated.

6 Seeing that no studies to the  
7 environmental impact on threatened  
8 endangered species and migratory birds have  
9 been done for the site, an intensive  
10 full-year study should be conducted. This  
11 study should include endangered species,  
12 migratory birds, seasonal plants, insects,  
13 and fungi that are using in the site as a  
14 refuge. Regardless, the EIS should only be  
15 finalized when appropriate study of the  
16 site is concluded.

17 While this is a difficult process, a  
18 proper job must be done to ensure we reduce  
19 the impact from any of these options and to  
20 ensure that this document is correct when  
21 referenced in the future.

22 Thank you.

23 MS. HAMILTON: Ryan Lynch.

24 MR. LYNCH: (To the interpreter) It's  
25 okay. I'll give you my comments to read

1 when I'm done.

2 THE INTERPRETER: Okay.

3 MR. LYNCH: I'm going to read a  
4 portion of my comments today and I'll read  
5 a portion of them tomorrow.

6 So my name is Ryan Lynch, R-Y-A-N-L-Y-  
7 C-H. I'm a member of the North American  
8 Nanohertz Observatory for Gravitational  
9 Waves, or NANOGrav.

10 Arecibo is absolutely critical to our  
11 efforts to detect low frequency  
12 gravitational waves, and we strongly  
13 support its continuous science operations.  
14 I would like to raise a few points,  
15 specifically with regards to the Draft EIS.

16 As it's already been mentioned the  
17 Portfolio Review Committee recommended, and  
18 I quote, "The AST should reevaluate  
19 participation in Arecibo later in the  
20 decade, in light of the science  
21 opportunities and budget forecasts at the  
22 time." The Draft EIS did not directly  
23 include a current scientific  
24 impact-scenario study. So I ask the Final  
25 EIS either include scientific

1 impact-scenario study or that NSF conduct a  
2 separate process to address current  
3 scientific impact. Otherwise, references  
4 in the Portfolio Review and other studies  
5 are out of date.

6 Along those lines, the Draft EIS  
7 referenced decadal and mid-decadal report  
8 has evidenced Arecibo lower scientific  
9 priority. But this is not justified by the  
10 communities and NSF's decision to award,  
11 for example, NANOGrav with a Physics  
12 Frontier Center grant totaling 14 and a  
13 half million dollars over five years.  
14 Also, a multi-messenger astronomy has been  
15 highlighted as one of five big ideas to be  
16 pursued by NSF foundation-wide over the  
17 next several years. Gravitational-waves  
18 astronomy is an example of multi-messenger  
19 astronomy.

20 The assertion that Arecibo is of lower  
21 scientific priority is simply not justified  
22 in the current scientific environment. In  
23 addition to the Physics Frontier Center  
24 grant that I just mentioned -- well, NSF  
25 funds the NANOGrav through. NANOGrav also

1 uses 800 hours of open sky in Arecibo,  
2 valued at approximately 1.6 million dollars  
3 per year. By comparison, the LIGO  
4 gravitational waves detector costs  
5 1 billion dollars to build and has an  
6 operational budget of 30 million dollars  
7 per year. The proposed LISA space  
8 gravitational waves detector will also be  
9 over 1 billion dollars total. I won't say  
10 that these are not incredibly worthy and  
11 scientifically valuable projects, but  
12 NANOGrav can open a unique part of the  
13 gravitational waves spectrum for a fraction  
14 of this cost.

15 Also, international facilities, most  
16 notably the FAST telescope under  
17 construction in China, have been cited as  
18 potential replacements for the unique  
19 capabilities of Arecibo. If FAST operates  
20 as planned, it would be a wonderful  
21 scientific instrument, and I look forward  
22 to that. However, it is very much an open  
23 question as to whether FAST will actually  
24 achieve these ambitious performance goals,  
25 and right now Arecibo remains the most

1 sensitive, single-dish radio telescope in  
2 the world and may very well remain so for a  
3 foreseeable future.

4 I will read the rest of my comments  
5 tomorrow. (To the interpreter) Now I'll  
6 pass this up to you.

7 MS. HAMILTON: Gerrit Verschuur.

8 MR. VERSCHUUR: I'm going to read one  
9 paragraph. It will be translated by this  
10 gentleman [the interpreter], and then I'll  
11 read my second paragraph.

12 All the traffic and transportation  
13 statements in the DEIS include this rather  
14 disingenuous claim: "Minor, adverse,  
15 short-term impacts to traffic and  
16 transportation would be expected during  
17 deconstruction." Only someone who has  
18 never driven on the local roads would claim  
19 that only minor impacts would be  
20 experienced. Having hundreds of  
21 debris-laden trucks navigating local roads,  
22 for instance taking shortcuts across to  
23 Highway 10, will cause enormous damage and  
24 pose traffic hazards all day, every day.  
25 Will the city of Arecibo be willing to



1        repay this minor damage?

2                This EIS statement is yet another  
3        example of why the present draft is  
4        ill-considered and needs to be rewritten.  
5        The EIS states that in a funding  
6        constrained environment NSF needs to  
7        maintain a balanced research portfolio with  
8        largest scientific return for the taxpayer.  
9        The projected shortfall in NSF's budget by  
10       2023 is, in a flat budget, around 60  
11       million dollars. The net worth savings  
12       from divestment of Arecibo it's about 4  
13       millions dollars. This is insignificant in  
14       terms of the overall budget shortfall. To  
15       meet its budget, NSF needs to go back to  
16       draw a realistic long-term plan before it  
17       does permanent damage to the U.S.  
18       scientific infrastructure for virtually no  
19       return.

20               MS. HAMILTON: Joan Schmelz.

21               MS. SCHMELZ: My name is Joan Schmelz.  
22        I'm the deputy director of Arecibo  
23        Observatory and I'm speaking today as the  
24        principal investigator of two NASA grants  
25        that find one third of the Observatory

1 budget.

2 According to the Space Studies Board  
3 of the National Research Council 2010  
4 report called "Defending Planet Earth"  
5 immediate action is required to ensure the  
6 continued operation of the Arecibo  
7 Observatory. NASA and the NSF should  
8 support a vigorous program of radar  
9 observations of near-Earth objects for  
10 orbital determination and the  
11 characterization of physical properties.

12 The huge variation of the properties  
13 of asteroids makes it impossible to develop  
14 a comprehensive inventory by sending  
15 spacecraft to each potentially dangerous  
16 asteroid individually. The cost would be  
17 astronomical. For example, the cost of  
18 NASA's OSIRIS-REx mission, the first U.S.  
19 spacecraft to visit an asteroid and return  
20 a sample to Earth, is almost 1 billion  
21 dollars. Compare that to the annual budget  
22 of the Arecibo Observatory Planetary Radar  
23 Program, just 4 million.

24 The Planetary Radar Program at Arecibo  
25 Observatory can study orders of magnitude

1 more asteroids at orders magnitude less  
2 cost than dedicated spacecraft missions.  
3 In fact, NASA has stated that it will not  
4 send a mission to an asteroid that had not  
5 been studied first with radar.

6 The spacecraft reconnaissance mission  
7 makes sense only if NASA knows with near  
8 certainty that an asteroid will hit the  
9 Earth. Such a mission would be feasible if  
10 there was sufficient time to develop,  
11 build, and launch a spacecraft that could  
12 deflect the asteroid and ensure that it  
13 does not collide with Earth. The vital  
14 ground-based observation of Arecibo is a  
15 small price to pay for the possible  
16 preservation of civilization itself.

17 The misinformation in the Draft EIS  
18 should be corrected to accurately describe  
19 the role of the Planetary Radar Program as  
20 a national priority.

21 (Whereupon, an audience member reads  
22 in Spanish Ms. Schmelz comments.)

23 MS. HAMILTON: Justine González-Vélez.

24 MS. GONZÁLEZ: My name is Justine  
25 González-Vélez. Good evening to all those

1 present right now. I'm a member of the  
2 Arecibo Observatory Space Academy.

3 Since I started at the Arecibo  
4 Observatory Academy at the age of 16 it  
5 provided me with the scientific education  
6 and the tools necessary to conduct a  
7 successful scientific research. That's the  
8 place that saw me take my first steps into  
9 scientific research, and it saw me grow as  
10 a student and as a person.

11 What I want to say with this is that  
12 Puerto Rico does not have many places that  
13 can foster scientific research by young  
14 people and that can foster the interest of  
15 young people in the sciences and research.  
16 If the youth of Puerto Rico has these tools  
17 that the Arecibo Observatory provides for  
18 free, with no cost, we should take  
19 advantage of it.

20 We are all gathered here with one  
21 purpose and that purpose is to discuss  
22 issues related to science. The future  
23 generation is just coming up, and that's  
24 the reason why we are here in support of  
25 the Arecibo Academy and of the Arecibo

1 Observatory. And the analogy that I want  
2 to make is that if I'm a bread-maker and I  
3 don't have any flour, what am I going to  
4 make the bread with? By the same token, if  
5 I do not have the tools necessary for  
6 continuing science research and I don't  
7 have within my reach those things that are  
8 necessary for my to continue studying  
9 sciences, how am I going to have a future  
10 as a professional in the sciences?

11 Therefore, we should highlight the  
12 wonderful characteristics of the Arecibo  
13 Observatory and prioritize those programs  
14 that interest youth in the field of  
15 sciences. With this, I want to wish a long  
16 life to the Arecibo Observatory so that it  
17 can create the future leaders that will  
18 follow the path of the sciences, the arts,  
19 math, and all other related fields.

20 Thank you.

21 MS. HAMILTON: Just as an update, we  
22 have 10 more speakers who asked to speak,  
23 and it is a little after 8:20. So I'm  
24 trying to get you all in.

25 Kristen Jones.

1 MS. JONES: My name is Kristen Jones,  
2 K-R-I-S-T-E-N-J-O-N-E-S. I had a speech  
3 for you, but we don't have time for that,  
4 so I'm just going to talk what's on my  
5 mind, my personal opinion.

6 Let's talk about broader impacts. In  
7 the NSF issue statement, one of the  
8 priority goals that it has is -- let me  
9 read: "Improve the nation's capacity in  
10 data science by investing in the  
11 development of human capital and  
12 infrastructure."

13 In choosing the content of this goal,  
14 the acknowledgement of the success of the  
15 NSF and the success of science and  
16 technology depends on fostering and  
17 mentoring minority groups, such as people  
18 of color and women in the field of science,  
19 acknowledging that they are untapped but  
20 expanding portion of the country's  
21 potential intellectual capital. This is  
22 represented throughout NSF as a concept of  
23 broader impacts.

24 My concern with Draft Environmental  
25 Impact Statement is that broader impacts do

1 not appear to be addressed at all. If they  
2 had been addressed, the deliberate  
3 connections between Arecibo Observatory and  
4 minority students such as the one who just  
5 spoke, sorry I didn't catch your name,  
6 would have become apparent. Arecibo  
7 Observatory hosts one of the longest  
8 running REU programs, reaching over 400 REU  
9 students who are minorities, often  
10 minorities and women of science. It has  
11 the AOSA Program, and I could go on and  
12 list.

13 So my concern is that the DEIS does  
14 not address the broader impact and how  
15 Arecibo Observatory reaches out to minority  
16 groups, such as students of color and  
17 women, in the science field. More than  
18 that, it sort of completely ignores the  
19 injustice and perpetuates the problems of  
20 both sexism and racism in the field in the  
21 manner in which it assesses the Observatory  
22 as -- um. What is the exact phrase? Of  
23 lower scientific impact.

24 There are numerous references about  
25 how assessing institutions that are

1 primarily minority-serving and  
2 predominantly helpful towards women are  
3 grounded in implicit bias. I recommend  
4 Harvard's project Implicit, for example.

5 At the very least, this broader impact  
6 of Arecibo on minorities and women in  
7 science needs to be studied and included in  
8 the EIS. This is a broader environment  
9 rather than the more specific local  
10 environments we've talked about. Not  
11 addressing these concerns is not the act of  
12 remaining neutral. Either you are fighting  
13 injustice, trying to take steps to address  
14 your bias, or through inaction you are  
15 condoning and supporting that bias, thus  
16 allowing it to continue.

17 MS. HAMILTON: Robert Minchin.

18 MR. MINCHIN: I'm Robert Minchin,  
19 group lead for Radio Astronomy, speaking  
20 here on a personal capacity.

21 I have read through this document and  
22 it is my personal opinion it is a tapestry  
23 of obfuscation, omissions, and outright  
24 lies. Let me illustrate.

25 The NSF's preferred option,



1       Alternative 1, involves the demolition of  
2       the Administration Building as obsolete.  
3       The fact that this is the house of the  
4       scientific staff is not mentioned. But we  
5       must assume that this option, therefore,  
6       means running the Observatory without any  
7       scientific staff. This would limit the  
8       available options for partners and make  
9       this alternative, at least in this form,  
10      nonviable.

11             Just last week, I was working with  
12      some of our most experienced observers, the  
13      ALFALFA Team from Cornell University,  
14      troubleshooting problems with their  
15      observations. It cannot be over emphasized  
16      that without an onsite radio astronomy  
17      staff working closely with the technical  
18      staff you do not have a radio astronomy  
19      program. But that is not all the  
20      scientific staff do.

21             As I pointed out in the last meeting,  
22      and which was apparently completely  
23      ignored, the Observatory would be in the  
24      top 10 universities in the U.S. by the  
25      number of Hispanic physics undergraduates

1       it educates on our intern program. We also  
2       run a space academy for local high school  
3       students. We are working with professors  
4       at Puerto Rican universities to establish  
5       astronomy and space science programs, and  
6       we run a biannual radio astronomy school  
7       for graduate students. All of this  
8       schooling to PhD pipeline relies on the  
9       Observatory scientific staff, a fact the  
10      Draft omits to mention.

11             Removal of the scientific staff would  
12      massively set back efforts to bring Puerto  
13      Ricans into astronomy and space sciences  
14      and send messages to Hispanics and other  
15      minorities that the NSF doesn't care. Yet  
16      the Draft report makes the claim that there  
17      would be no disproportionate impact on low  
18      income or minority populations. That is an  
19      outright lie.

20             MS. HAMILTON: Anne Virkki.

21             MS. VIRKKI: I actually had multiple  
22      comments, but I'm going just with the  
23      shortest one to save you all -- I have my  
24      own translator.

25             I understood that the Alternative 1

1 includes all potential collaboration plans.  
2 How can the reader know which impacts  
3 belong to which plan? If this is the  
4 recommended option, it should be also the  
5 most accurately defined. Now, it's the  
6 most ambiguous one.

7 In spite of the choice of the  
8 collaboration plan, this will change the  
9 Final Environmental Impact Statement from  
10 the draft version drastically and, as such,  
11 will not give the public the possibility to  
12 comment on all aspects.

13 As stated in the NSF website, as a  
14 public agency, NSF is responsible for  
15 building and sustaining the public trust  
16 through the transparency of our processes  
17 and accountability of our organization.

18 MS. HAMILTON: Topasi Ghosh.

19 MS. GHOSH: Hello. My name is Topasi  
20 Ghosh. I'm a scientist at the Arecibo  
21 Observatory. But what I'm going to say is  
22 my own opinion, and I have my own  
23 translation, too. Thank you.

24 In the listed options presented by the  
25 NSF at the June EIS scoping meeting,

1 reference to the demolishing of any  
2 structure was included only in the last  
3 option of deconstruction and site  
4 restoration. However, the DEIS, as many of  
5 us here have pointed out, now considers  
6 various lists of entities to be destroyed,  
7 even for the favored option number one,  
8 "Collaboration with Interested Parties for  
9 Continued Science-focused Operations."

10 I argue that with the addition of the  
11 demolition of 26 vital working areas the  
12 favored option is internally inconsistent  
13 with it. It is presupposed a mode of  
14 operation which might make collaboration  
15 with interested parties limited and, hence,  
16 makes the goal of the very option itself  
17 difficult to achieve.

18 I also argue that the general public  
19 was denied of any opportunity to provide  
20 any feedback on the scientific, social, and  
21 commercial impact of the stated Alternative  
22 1 with partial removal of infrastructure.  
23 Any comments raised now should be included  
24 in a second draft and should be brought to  
25 public for further comments before

1 finalizing the report.

2 Thank you.

3 (Whereupon, Ms. Ghosh reads her  
4 comments in Spanish.)

5 MS. HAMILTON: Chris Salter.

6 MR. SALTER: My name is Chris Salter.

7 I'm a scientist for the Arecibo  
8 Observatory. But this is a personal  
9 statement; and it's a statement involving  
10 the cultural environment of what the  
11 Observatory represents, not only for the  
12 whole of the U.S.A. but especially for its  
13 impact in the local community of Puerto  
14 Rico.

15 I thought tonight I'd illustrate this  
16 for a field marked out of its importance by  
17 the 2010 Decadal Report, mainly time domain  
18 astronomy.

19 Recently, Arecibo Observatory has  
20 discovered a unique source of repeating  
21 radio bursts, studied their properties, and  
22 is key to determining the position of the  
23 source in the sky of the order of thousands  
24 of a second of arc; and a second of the  
25 second of arc, let me make clear, is a

1 quarter observed from Washington. As held  
2 up in Europe, it's tiny.

3 We now know that this mystery source,  
4 and it stays a mystery, is some three  
5 billion light years away from us. It's  
6 situated not in our Milky Way Galaxy but in  
7 a very, very distant galaxy indeed.

8 Given this sort of discovery, is it  
9 any surprise that the Observatory is a  
10 unique source of pride to our local  
11 community and an inspiration to our young  
12 people to study and make their own  
13 researches in STEM fields, where Puerto  
14 Rico has been so sadly underrepresented  
15 over the years? I think this aspect does  
16 not come through in the Draft Environmental  
17 Study.

18 Thank you.

19 MS. BLANCO: Folks, I think we have  
20 five more speakers. It's almost 9:00, and  
21 the folks we are renting this room from  
22 will be here at 9:00. So please keep your  
23 comments to three minutes. And if you have  
24 your own translation, please state so at  
25 the very beginning. If not, let's do one

1 sentence and then one sentence, so we don't  
2 lose more time.

3 Thank you.

4 MS. HAMILTON: Luisa Zambrano.

5 MS. ZAMBRANO: My name is Luisa  
6 Fernanda Zambrano-Marín, and these are my  
7 own expressions and not my employer.

8 Have you read the document, Ralph?  
9 Carol?

10 MS. BLANCO: Yes.

11 MS. ZAMBRANO: Okay.

12 You know Arecibo. You receive annual  
13 reports of our work. You publish; you  
14 know. How can you publish a document that  
15 states "Minor or negligible impact to  
16 public safety by ceasing operations of the  
17 Radar Program"? Your office knows the  
18 system's capabilities and its annual  
19 asteroids detections.

20 Arecibo has participated in multiple  
21 asteroid and comet missions, such as Dawn  
22 Mission, NEAR-Shoemaker, EPOXI, JAXA,  
23 Hayabusa, and the recently launched  
24 OSIRIS-REx Mission, and helped recover the  
25 SOHO satellite. It will also help future

1 deflection missions, including the ESA NASA  
2 Asteroid Impact and Deflection Assessment  
3 AIDA and the Asteroid Retrieval Mission.

4 Arcibo currently provides support to  
5 the Lunar Reconnaissance Orbiter and  
6 supports tracking of the commissioned lunar  
7 satellites. The company hired to do the  
8 Environmental Impact Statement should look  
9 at the value implications of space  
10 missions, support, and participation.

11 (Whereupon, Ms. Zambrano reads in  
12 Spanish her comments.)

13 MS. HAMILTON: Ramón Lugo.

14 MR. LUGO: I'm going to submit mine in  
15 written.

16 MS. HAMILTON: Okay. Thank you.

17 Jesús Lautenbach. My apologies, Jens  
18 Lautenbach. Is he not here anymore?

19 We will move on to Wilbert Rupert.

20 MR. RUPERT: (To the interpreter) You  
21 can translate after I finish.

22 THE INTERPRETER: I'm sorry. I will,  
23 or I won't?

24 MR. RUPERT: You will.

25 THE INTERPRETER: Okay. So you have



1 it written. Okay. Go ahead.

2 MR. RUPERT: Good afternoon. My name  
3 is Wilbert Rupert and today I came here to  
4 present my views on the Arecibo Observatory  
5 situation.

6 I am part of the Observatory's  
7 Pre-college Research Academy known as AOSA.  
8 We the alumni of the Academy have been  
9 following this process since back to its  
10 beginnings in May. We are concerned about  
11 what impacts the outcomes could have on the  
12 continuation of AOSA.

13 Even though AOSA is funded by the NASA  
14 SERVIR Program and thus is not affected by  
15 budget cuts of the NSF, it will truly be  
16 affected by the deconstruction of certain  
17 parts of the site which are used by the  
18 students as part of their research.  
19 Students use the real telescope itself and  
20 even the soil and water of the flora of the  
21 site in order to study it.

22 Where else could high school students  
23 in Puerto Rico be mentored by specialized  
24 scientist at one of Earth's most important  
25 scientific facilities? It's true. You may

1 think that there are other research  
2 programs in this island, but none offer the  
3 technology and instruments we have in  
4 Arecibo.

5 Now, considering the five alternatives  
6 that the NSF has developed and published, I  
7 can partially agree with them that  
8 Alternative 1 should be the one to take  
9 since it seems to affect less the  
10 continuation of operations of the whole  
11 site. However, and in accordance to what  
12 I've said before, I have my reservations as  
13 to the deconstruction of buildings that are  
14 used for researched and other scientific  
15 and technological endeavors.

16 I understand that a few might be  
17 obsolete and should be acknowledged in  
18 order to cut expenses and such. But let's  
19 consider other options. Since these are  
20 scattered around the Observatory's ground,  
21 why not think of relocating all possible  
22 offices of operations to centralized areas,  
23 giving feasible conditions and resources.  
24 This way you will be taking out a minimum  
25 of the capacity and would also be saving

1 the work of dozens of employees whose  
2 families depend on them.

3 I urge you to ponder upon all the  
4 alternatives and ideas exposed today and to  
5 be incisive in looking for partnerships  
6 with other interest parties. It is  
7 important to remember how essential the  
8 Arecibo Observatory is to us as students,  
9 to scientists, to workers, to young  
10 children inspired by space and the  
11 magnitude of the Observatory when they  
12 visit the Visitor Center, to tourism,  
13 economy, and to the cultural identity of  
14 Puerto Rico. Most importantly it is  
15 important to the advancement of the STEM  
16 fields and our scientific knowledge and to  
17 the safeguarding of our planet from the  
18 asteroids and other celestial threats.

19 Thanks.

20 MS. HAMILTON: The final speaker for  
21 this evening is Pablo Llarandi.

22 MR. LLARANDI: Good evening. I will  
23 translate the introduction and then I will  
24 ask the gentleman [the interpreter] to help  
25 me with the rest.

1 Hello, everybody. My name is  
2 Dr. Pablo Llarandi-Román. I am a professor  
3 at the Department of Physical Sciences of  
4 the University of Puerto Rico in Río  
5 Piedras and a geologist. More importantly,  
6 for me, I'm an Arecibeño; I'm from Arecibo.

7 I'll begin by saying that my main  
8 purpose in speaking here tonight is related  
9 to what the fellow who spoke before me  
10 mentioned before. I'm a scientist in part  
11 because the Arecibo Observatory is in my  
12 town.

13 When I was a child I had the  
14 opportunity to visit the Observatory on  
15 multiple occasions. In my family I have an  
16 uncle who was an attorney and who worked at  
17 the Observatory, and that was my door of  
18 entry into the Control Room. So you can  
19 imagine a little kid, like me, interested  
20 in everything having to do with sciences  
21 and with the space listen for the first  
22 time to a true-life scientist explaining  
23 everything having to do with scientific  
24 research.

25 So I urge the NSF to take into account

1 all of the aspects of the broader impact  
2 that this has on scientific education in  
3 Puerto Rico, for kids in Puerto Rico and  
4 for any person interested in learning about  
5 science, and also to take into account the  
6 role that the Arecibo Observatory has  
7 played in such a manner that has sparked  
8 our interest in maintaining this facility  
9 for posterity.

10 I only have a couple of more  
11 commentaries and I will soon close.

12 The National Science Foundation talks  
13 about national priority of closing  
14 operations gradually at the Observatory.  
15 But I strongly urge you to take into  
16 consideration the Puerto Rican priority of  
17 maintaining such a facility for the  
18 interest of Puerto Rico and for the  
19 international community that visits it.

20 Are there any representatives from the  
21 municipality of Arecibo? Anybody? Or from  
22 the Government of Puerto Rico? I would  
23 like for you to consider contributing to  
24 these alliances, either with funds or  
25 otherwise, to the continuation of the

1       Arecibo Observatory because this is ours  
2       and we cannot let it go.

3               MS. HAMILTON: We do have one more  
4       comment. Can you please state your name?

5               MS. PANTOJAS: My name is Dr. Carmen  
6       Pantojas. I am a professor of Physics at  
7       the University of Puerto Rico and I want to  
8       comment on the Alternative 1.

9               It says that NSF will reduce its  
10       funding, and under Alternative 1 the future  
11       stakeholders are responsible for  
12       maintenance and upgrades. But that  
13       alternative is not clear. What is the  
14       amount that NSF will provide and for how  
15       long? It is not clear in that alternative  
16       either for those stakeholders -- are they  
17       responsible for future deconstruction and  
18       site restoration under Alternative 1? And  
19       if so, it needs to address specifically how  
20       much would that deconstruction and site  
21       restoration cost in 2016.

22               In regard to Alternative 2, which is  
23       the education alternative, it mentions  
24       entities interested, or the Government of  
25       Puerto Rico, or entities in Puerto Rico.

1 But what are those entities that is  
2 considering, other than the Government of  
3 Puerto Rico, to take the facility for  
4 education and have the Observatory but  
5 without the telescope? That is another  
6 comment for that alternative.

7 The third, Arecibo Observatory is a  
8 historic property that is included in the  
9 National Register of Historic Places.  
10 There is no way to minimize or avoid or  
11 mitigate the adverse effects of  
12 deconstruction of a historical site of  
13 worldwide recognition and importance. The  
14 U.S. would lose an important historical  
15 place and the world will lose a historical  
16 place. That needs to be addressed.

17 The other thing, the Observatory, its  
18 purpose is the future generations. The  
19 purpose of the NSF is the future  
20 generations. This draft does not address  
21 clearly how many graduate students in  
22 astrophysics -- because that is the pull  
23 from which we will have the future  
24 scientists: the graduate students. From  
25 there we'll have the pull for the future.

1           How many graduate students use Arecibo  
2           versus the future instruments that are so  
3           expensive that we are replacing -- because  
4           if we close all the radio observatories,  
5           where are the U.S. graduate students going  
6           to train?

7           Arecibo will never be a small  
8           telescope. It is a place for graduate  
9           students to study, to train to be  
10          radio-astronomers. If we close all the  
11          radio telescopes, those sophisticated  
12          instruments will be oversubscribed, and  
13          that is not addressed either. How the  
14          oversubscription will affect the graduate  
15          students that come from smaller  
16          universities? How will they train? Only  
17          the big institutions will be able to easily  
18          get access to the big facilities. So that  
19          needs also to be addressed.

20          And the other point is the minorities.  
21          How many minority-graduate students are  
22          using Arecibo to train, and how that will  
23          be affected adversely? I am a professor of  
24          physics at the Department of Physics at the  
25          UPR. I am the only woman in the Department



1 of Physics and I did my graduate studies at  
2 the Arecibo Observatory. So I know this  
3 would have an adverse effect.

4 Thank you.

5 (Whereupon, the interpreter and the  
6 court reporter try to set the digital  
7 recorder in order to listen to a  
8 portion of the audio.)

9 MS. BLANCO: We are working on the  
10 translation.

11 THE INTERPRETER: She ad-libbed most  
12 of it so that's what I'm --

13 MS. PANTOJA: I can translate.

14 THE INTERPRETER: (To Ms. Blanco) I  
15 mean, it's for your record. But if you  
16 want it for the record, what she said, then  
17 I'll have to go back, listen to the  
18 recording, and I'll do it simultaneously.

19 MS. BLANCO: While we're waiting for  
20 the translation, I would like to remind  
21 everybody that they can still submit  
22 written comments by email or by regular  
23 mail through December 12.

24 We will also be having another public  
25 meeting tomorrow morning from 10:00 to

1 12:00, at the Doubletree Hotel, in San  
2 Juan. And as a reminder, it's open to the  
3 public. The Section 106 meeting is  
4 scheduled from 1:00 to 2:30, also at the  
5 Doubletree Hotel tomorrow.

6 The next step after this will be  
7 issuance of the Final Environmental Impact  
8 Statement that will reflect the comments  
9 that we've obtained during this  
10 45-day-public comment period. That will  
11 happen later in the spring of 2014.

12 And now for the translation.

13 THE INTERPRETER: It was not possible.

14 MS. BLANCO: Not possible. Okay.

15 (To Ms. Pantojas) Could you, please,  
16 as best as possible --

17 (Whereupon, Ms. Pantojas translates  
18 her comments to Spanish.)

19 MS. BLANCO: Thank you for sharing  
20 that, and thank you all for providing your  
21 comments. You can provide them by written.

22 We are going to end the official  
23 meeting now. If you have comments, please  
24 submit them by email or writing, or you can  
25 come to the meeting tomorrow between 10:00

1 to 12:00, in San Juan.

2 Thank you.

3 (Whereupon, the public meeting  
4 concludes at 9:25 p.m.)

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REPORTER'S CERTIFICATE

I, ALEJANDRA DOMÍNGUEZ MENÉNDEZ, E.R.

Reporter, do hereby certify that the following transcript is a full, true record transcribed by me.

I further certify that I am not interested in the outcome of the case named in said caption.

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ALEJANDRA DOMÍNGUEZ MENÉNDEZ