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

held on Thursday, November 17, 2016, at the Doubletree
Hotel, 105 De Diego Avenue, San Juan, Puerto Rico,
00914, beginning at 10:15 a.m.

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IN SAN JUAN, PUERTO RICO
THURSDAY 17, 2016
PROCEEDINGS

MR. GAUME: Please, take your seats,
and we'll get started here.

Good morning. Thank you for coming to
our public meeting on the Arecibo Draft
Environmental Impact Statement. If you are
at the wrong meeting, now it's your time to
head to the exit.

So this is what we are planning to do
today. First, I'll introduce the team
members. We'll talk about the materials
and the transcript of this proceeding.
We'll talk about the purpose of the
meeting. We'll talk about the Draft
Environmental Impact Statement and
summarize that. Then it will be your turn
to provide public comments. If you haven't
already -- if you would like to speak and
haven't already signed up, please sign up.

First, the introductions. My name is
Ralph Gaume and I'm the Arecibo Observatory
Program Director for NSF. This is Caroline

1 Blanco. She's our Assistant General
2 Counsel for NSF. In a few minutes, when
3 I'm done with my portion of the
4 presentation, Kristen Hamilton will be
5 talking. She is the Environmental
6 Compliance officer for the National Science
7 Foundation. Also from the NSF we have
8 Karen Pearce, who is our senior Legislative
9 Affairs specialist; also, Ivy Kupec, our
10 Public Affairs specialist.

11 NSF has worked with CH2M Hill, who is
12 providing contractor support to us in
13 preparation of the DEIS. From CH2M Hill we
14 have Lori Price, who is our Cultural
15 Resources lead. Over here we have Richard
16 Reaves, who is our Ecology and National
17 Environmental Policy Act lead.

18 The materials we have for today are
19 the fact sheets and the information boards
20 which we have here. Feel free to take this
21 fact sheets home with you. I think we want
22 to somehow fit the information boards on an
23 airplane. This presentation and electronic
24 versions of the fact sheets and information
25 boards will be soon posted at this website

1 (showing in the slide).

2 So the purpose of this meeting is that
3 a Draft Environmental Impact Statement has
4 been prepared by the National Science
5 Foundation to evaluate potential
6 environmental impacts of the proposed
7 operational changes to the Arecibo
8 Observatory due to funding constraints.
9 The Notice of Availability, NOA, for the
10 Draft EIS has been published in the federal
11 register, emailed to our entire stakeholder
12 list, and posted on our website on October
13 28. And the purpose of this meeting is to
14 allow for public comments on the Draft EIS,
15 which will help inform the Final EIS.

16 It would be helpful for your comments
17 to be as specific as possible. We, of
18 course, welcome any comments on the Draft
19 EIS. A Section 106 consultation meeting
20 will be held immediately after this. We're
21 changing rooms. We will be changing rooms.
22 It's here, from 1:00 to 2:30, in the hotel,
23 but in a different room.

24 So the purpose of this proposed action
25 is to substantially reduce NSF's

1 contribution to the funding of Arecibo
2 Observatory. The need for the proposed
3 action is that NSF needs to maintain a
4 balanced research portfolio with the
5 largest scientific return for the taxpayer
6 dollar. The scientific community, through
7 reviews and surveys, has indicated that the
8 scientific capability of Arecibo
9 Observatory is lower in priority than other
10 scientific capabilities at NSF funds.

11 Please, see the Executive Summary of
12 the DEIS, Section 1 of the Draft EIS, for a
13 full background and explanation of why NSF
14 is proposing these changes. For the next
15 few slides, I wanted to review what the
16 scientific community is telling us.

17 In 2012 the National Science
18 Foundation, the Division of Astronomical
19 Sciences Portfolio Review Committee was
20 formed as a subcommittee of the Advisory
21 Committee of the National Science
22 Foundation director of Mathematical and
23 Physical Sciences. The Portfolio Review
24 Committee was subject to regulations
25 pertaining to the Federal Advisory

1 Committee Act.

2 What that committee said was that AST
3 should reevaluate its participation in
4 Arecibo and SOAR later in the decade, in
5 light of the science opportunities and
6 budget forecasts at that time. If funding
7 remains tight later in the decade, then,
8 the scientific need for continued AST
9 funding for Arecibo and SOAR must be
10 weighed against the needs of the grants
11 program.

12 This reevaluation of Arecibo began
13 with a Dear Colleague Letter that NSF
14 published on October 2015, which requested
15 viable concepts for the future of Arecibo
16 Observatory, specifically including
17 strategies and goals for continued
18 operations that involve a substantially
19 reduced funding commitment from NSF. In
20 addition, in 2015, the NSF Division of
21 Atmospheric and Geospace Sciences performed
22 a portfolio review as a subcommittee of the
23 Advisory Committee of the NSF Directorate
24 for Geosciences.

25 Like the Astronomical Sciences

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

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

1 Astrophysics." Recently, the National
2 Academies formed a committee to review
3 progress toward the decadal survey vision.
4 Last August, this committee reported that
5 the NSF should proceed with divestment from
6 ground-based facilities that have a lower
7 scientific impact, implementing the
8 recommendations of the NSF Portfolio
9 Review, which is essential to sustaining
10 the scientific vitality of the U.S.
11 Ground-based Astronomy Program as new
12 facilities come into operation.

13 The final scientific committee report
14 which I will mention today is the Astronomy
15 and Astrophysics Advisory Committee, which
16 is a committee formed by Congress in 2002.
17 It reviews NSF, NASA, and the Department of
18 Energy, Astronomy and Astrophysics Program.
19 Annually the Astronomy and Astrophysics
20 Advisory Committee sends reports on NSF,
21 NASA, and Department of Energy, Astronomy
22 and Astrophysics Program to several
23 congressional science-related committees,
24 both in the House of Representatives and
25 the Senate.

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

14 I should have mentioned earlier that,
15 in addition, NASA is serving as a
16 cooperating agency for this Environmental
17 Impact Statement.

18 With regards to Arecibo, NASA is the
19 federal government agency that has the
20 responsibility and the funding for
21 detecting and tracking asteroids. As I
22 mentioned, they are a cooperating agency in
23 this EIS. But the responsibility for
24 asteroids falls to NASA, not the National
25 Science Foundation.

1 So let's take a look at the
2 alternatives. The first alternative is the
3 collaboration with interested parties for
4 continued science-focused operations. As
5 we presented during the scoping meeting,
6 all six of these alternatives were
7 identified in that they could meet the
8 purpose of substantially reduce NSF
9 funding.

10 The second alternative is the
11 collaboration with interested parties for
12 transition to education-focused operations.

13 Number three is the mothballing of
14 facilities. And please note that
15 "mothballing" means "suspension of
16 operations in a manner such that operations
17 could resume efficiently at a future date."

18 Alternative 4 is a partial
19 deconstruction and site restoration. And
20 please note that Alternative 4 involves
21 deconstruction of all above-grade
22 structures, except for the large concrete
23 structures; that is the towers, tower and
24 catwalk anchors, and rim wall
25 infrastructure. In Alternative 4 all

1 below-grade foundations would be stabilized
2 and filled in.

3 NSF's preferred alternative, as
4 identified in the Draft EIS, is
5 Alternative 1. This alternative would meet
6 the purpose and need of reducing the
7 funding required for NSF while allowing
8 continued benefits to the scientific and
9 educational communities. However,
10 Alternative 1 can only be implemented if
11 new stakeholders come forward to
12 participate as collaborating parties with
13 viable proposed plans to provide additional
14 non-NSF funding in support of their
15 science-focused operations.

16 Finally, in my last chart -- let me
17 mention a little bit about Alternative 1.
18 Note that for each proposed alternative,
19 including Alternative 1, NSF has identified
20 which buildings and infrastructure would be
21 retained, deconstructed, mothballed, or
22 safe abandoned. This level of detail is
23 absolutely necessary for ensuring that the
24 environmental impact analysis adequately
25 addresses each proposed alternative. Now,

1 you might ask how these listed
2 buildings -- how was the list of buildings
3 selected.

4 In October 2015, NSF issued a Dear
5 Colleague Letter requesting viable concepts
6 for future continued operations of Arecibo
7 Observatory. In part, NSF utilized the
8 responses that were received to inform and
9 determined which buildings and
10 infrastructure would be included for study
11 in the EIS. The Dear Colleague Letter did
12 not limit the responders or direct the
13 responders to a specific solution.
14 Instead, it allowed the responders to
15 propose innovative and operational models
16 that may require a subset of the existing
17 buildings and infrastructure.

18 It is possible that a subset of the
19 buildings and infrastructure identified
20 currently under proposed Alternatives 1 and
21 2 could be retained, deconstructed,
22 mothballed, or safe abandoned as the EIS
23 process moves forward.

24 Now I turn this over to Kristen
25 Hamilton. I think Kristen has a couple of

1 more words on this slide that she wanted to
2 say.

3 MS. HAMILTON: Thank you, Ralph. Good
4 morning. Again, I'm Kristen Hamilton. I
5 will be walking through the environmental
6 review process today.

7 As for what Ralph was just saying, I
8 just want to reemphasize that the number of
9 buildings identified for deconstruction,
10 for example in Alternatives 1 and 2, are
11 the most inclusive scenario. But a smaller
12 subset may or may not be selected.

13 This slide provides information on the
14 scoping process that occurred last spring.
15 Meeting materials are available on our
16 website and the transcript from those
17 meetings is attached to the DEIS as an
18 appendix. Over 80 attendees participated
19 in the two scoping meetings and 240
20 comments were submitted to NSF. The
21 comments are addressed in Section 5 of
22 DEIS.

23 The Draft Environmental Impact
24 Statement contains an executive summary
25 which provides a concise overview of the

1 DEIS. So it's only 26 pages, but we really
2 tried to make it capture all of the main
3 findings of the document. It's provided on
4 our website in both English and Spanish.

5 The Purpose and Needs Section provides
6 the rationale for NSF's proposed action.
7 The next section provides a full
8 description of each of the proposed
9 alternatives. The Affected Environment
10 Section provides an overview of the
11 existing physical, biological, economic,
12 and social conditions at Arecibo
13 Observatory. The Environmental
14 Consequences Section provides an evaluation
15 of the potential environmental impacts of
16 the proposed action under the five
17 alternatives. And the no action
18 alternative.

19 The impacts of each alternative's
20 implementation and operations phase are
21 assessed. In addition, mitigation measures
22 to reduce the duration, intensity, or scale
23 of the impacts are identified. And lastly,
24 the final sections of the DEIS provide
25 information on the process thus far and a

1 summary of the consultation that has
2 occurred that informed the DEIS.

3 So let's talk about impacts. Impacts
4 can include ecological, aesthetic,
5 historic, cultural, economic, social, or
6 health, and can be beneficial or adverse.
7 Wherever possible in the Draft EIS, the
8 type, duration, intensity, and scale for
9 any potential impact are identified.

10 This slide lists the resource areas
11 that we evaluated in the Draft
12 Environmental Impact Statement. I'll let
13 you read them, but you can see they cover a
14 diverse range of aspects of the
15 environment.

16 The DEIS and full appendixes, as well
17 as the Executive Summary in both languages,
18 may be found at our website and hardcopies
19 have been provided to these two libraries
20 as well (showing in the slide). We also
21 have a hardcopy right there on that table,
22 if anybody wants to look through it after
23 the meeting.

24 There are several ways to provide
25 comments on the EIS. Verbal comments can

1 be provided today at this meeting, and note
2 that all comments are being fully
3 transcribed today. Written comments,
4 either emailed or mailed, will be accepted
5 through December 12, 2016. The email
6 address and mailing address are up here
7 (showing in the slide). We can put this
8 information back up at the end.

9 I want to talk now about target dates.
10 We conducted our public scoping last May,
11 which, as I said, included a 30-day-comment
12 period. We considered those comments and
13 developed the Draft Environmental Impact
14 Statement, which was published on October
15 28. We are currently in the middle of a
16 45-day-comment period on that DEIS. We
17 will again be closely considering those
18 comments and revising the -- or preparing
19 the Final Environmental Impact Statement.
20 And we are targeting spring, hopefully May
21 of 2017 for that. There will be at least a
22 30-day-period after that, prior to making a
23 final agency decision, which we'll be
24 targeted for summer of 2017.

25 I also want to mention that our

1 compliance with two other acts, the
2 National Historic Preservation Act and the
3 Endangered Species Act, are going on in
4 parallel to the DEIS process and they are
5 also informing that process. So the same
6 information appears on both processes. And
7 we do have a meeting for Section 106 of the
8 National Historic Preservation Act, after
9 this meeting, in the same hotel, in a
10 different room, at 1:00. That is open to
11 anyone who wants to attend.

12 The Record of Decisions states the
13 Agency's chosen path, identifying all
14 alternatives considered and discussing
15 preferences based on relevant factors,
16 including science priorities, feasibility,
17 environmental considerations and
18 mitigations, and budget factors.

19 Before we turn to your comments, I
20 just want to remind you that comments can
21 be emailed, mailed, or written here and
22 left with us today. Again, we are
23 accepting comments through December 12.

24 As we enter the "your comment" phase
25 of the meeting, please remember to state

1 your name for our transcriber. We also ask
2 that you direct your comments to the
3 contents of the Draft Environmental Impact
4 Statement so that we can better hear you.
5 NSF will not address comments at this time.
6 We will be addressing those comments in the
7 Final Environmental Impact Statement.

8 We were just discussing the number of
9 people who signed up to speak. It looks
10 like we have about 11, and we have about an
11 hour. So if you can try to keep your
12 comments to five minutes or so -- five
13 minutes, trying to include the translation
14 portion. We hate to do it, but...

15 We can begin with Francisco Córdoba.

16 MR. CÓRDOBA: Thank you.

17 My name is Francisco Córdoba. I won't
18 need translation. I'll be able to say my
19 speech in English and then in Spanish. So
20 no worries.

21 THE INTERPRETER: Okay.

22 MR. CÓRDOVA: My name is Francisco
23 Córdoba. I'm the director of the Arecibo
24 Observatory and a member of SRI
25 International. This statement reflects the

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

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

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

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

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

7 MS. HAMILTON: Thank you.

8 One thing I should have mentioned is
9 that we love to hear your verbal comments
10 at these meetings, but ultimately verbal
11 and written comments will be considered
12 equally.

13 MS. HAMILTON: We now have Nick White
14 and Carlos Padín.

15 MS. WHITE: Okay. I think we are
16 doing them separately and will also provide
17 our own translation.

18 My name is Nicholas White. I'm from
19 the Universities Space Research
20 Association, USRA, and I am the senior
21 vice-president for Science at the
22 organization.

23 USRA is a non-profit organization with
24 a 105 member universities, all granting
25 PhDs in the space sciences. USRA is one of

1 the three partners managing the Arecibo
2 Observatory and is primarily responsible
3 for the astronomy and the planetary radar
4 science of the Observatory.

5 I'll focus my comments on the
6 planetary radar of to the Observatory,
7 where we find errors in the Draft EIS, in
8 particular summarizing the safety hazard.

9 You may have read in the newspapers
10 last month that NASA, the Federal Emergency
11 Management Agency or FEMA, and other
12 government agencies engaged in a planetary
13 protection exercise of the NASA Jet
14 Propulsion Lab. They did this to consider
15 the potentially devastating consequences of
16 a 330-foot asteroid hitting the planet
17 Earth.

18 This may seem like science fiction,
19 but these events are a real possibility.
20 One just has to remember the 2013
21 Chelyabinsk impact in Russia, which was
22 caused by an object only 20 meters across.
23 Despite its relatively small size, it
24 caused damage to 7,200 buildings and 1,500
25 people were injured.

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

12 Arecibo Observatory determines to
13 better than one part in 10 million the path
14 of the asteroid and whether or not it will
15 hit the Earth at some point in the future.
16 Such is the precision Arecibo Observatory
17 can predict the asteroid orbit for decades,
18 even centuries in the future so we would
19 have time to prepare a response.

20 The criticality of the Observatory has
21 been recognized by the National Academy of
22 Sciences. In a report in 2010, the Academy
23 recommended immediate actions required to
24 ensure the continued operation of the
25 Arecibo Observatory at a level sufficient

1 to maintain and staff the radar facility.
2 This recommendation has resulted in NASA
3 providing 3.7 million a year through USRA
4 to enable capability. And this is for the
5 one third of the funding at the
6 Observatory.

7 Furthermore, in 2005, the United
8 States Congress passed the George E. Brown,
9 Jr. Act that directed NASA to detect,
10 track, and characterize near-Earth objects
11 larger than 140 meters in diameter. In
12 2010, the goals of that act were
13 incorporated into the National Space Policy
14 of the United States of America that guides
15 the NASA administrators to pursue
16 capabilities in cooperation with other
17 departments, agencies, and commercial
18 partners; and I stress "other agencies," to
19 detect, track, catalogue and characterize
20 near-Earth objects to reduce the risk of
21 harm to humans from unexpected impact on
22 our planet. Shutting down the planetary
23 radar operations of Arecibo Observatory
24 will put lives and properties at risk.

25 NSF is the federal steward for this

1 facility, and it's USRA's expectation that
2 NSF will maintain the national need to
3 track and characterize near-Earth
4 asteroids. The DEIS fails to note all
5 these critical facts, and USRA requests
6 that it be corrected.

7 We, in addition, suggest that an
8 option be included: the continuous
9 operation of the facility with the prime
10 purpose to support the NASA funded
11 planetary radar.

12 I would like to end by saying that the
13 USRA, along with our partners, SRI and
14 UMET, remain committed to maintain the full
15 operation of the site. As part of this, we
16 are seeking all interested parties who can
17 bring funding to utilize the scientific
18 assets or even the site itself to ensure
19 that we can implement the NSF preferred
20 option when that can be realized.

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

23 MS. HAMILTON: Carlos Padín. After
24 him, it will be John Kelly.

25 MS. BLANCO: If I could just interject

1 for one moment. We have at least nine
2 speakers more to go, and it is already
3 almost 11:30. So, in order to give
4 everybody an opportunity to speak -- we do
5 have another meeting right after this. So
6 if you could please limit your comments to
7 four minutes, including translation, it
8 will be greatly appreciated.

9 MR. PADÍN: Okay. Let's go quickly
10 here.

11 My name is Carlos M. Padín Bibiloni.
12 I am the chancellor of Universidad
13 Metropolitana and a member of the
14 management team of the Arecibo Observatory.
15 This statement reflects the view of
16 Universidad Metropolitana and the Ana G.
17 Méndez University System of Puerto Rico
18 regarding the Educational and Public
19 Outreach Program of the Arecibo Observatory
20 and the socioeconomic impact of the
21 Agency-preferred Alternative, Alternative
22 1.

23 It is our understanding that the role
24 of Arecibo Observatory in Puerto Rico and
25 its impact on our educational efforts and

1 socioeconomic situation was not adequately
2 reflected nor considered in the Declaration
3 of Environmental Impact Statement Draft
4 Statement published by the National Science
5 Foundation, in October 2016.

6 First, the five alternatives presented
7 in said document underestimate the impact
8 of the Education and Public Outreach
9 Program of the Arecibo Observatory in
10 Puerto Rico. Second, the Draft's statement
11 does not recognize the significant role of
12 the Arecibo Observatory on the economic
13 development of the Island.

14 For over 53 years, the Arecibo
15 Observatory has established a significant
16 track record of scientific accomplishments
17 in astronomy, planetary science, and space
18 atmospheric science. Its world renowned
19 scientists have served as mentors to many
20 young scientists throughout the STEM
21 pipeline in the United States. Here in
22 Puerto Rico, in contrast with many
23 scientific research facilities in other
24 locations and particularly during this past
25 five years, the Arecibo Observatory and its

1 surrounding society have established a
2 close and significant partnership.

3 The Government of Puerto Rico has
4 invested more than 600 thousand dollars in
5 training teachers in the use of the Arecibo
6 Observatory in the classroom teachings.
7 The Ángel Ramos Foundation and the Ana
8 G. Méndez University System have invested
9 2.1 million to revamp the Science and
10 Visitors Centers because both partners are
11 certain of the educational contribution of
12 this cutting-edge research facility and its
13 potential to positively impact the STEM
14 pipeline in Puerto Rico. The Puerto Rico
15 Infrastructure Financing Authority also
16 provided 800 thousand dollars for
17 infrastructure improvement at the Arecibo
18 Observatory.

19 These actions all point out to a real
20 commitment of the people of Puerto Rico to
21 the Arecibo Observatory. Another key
22 aspect of the Arecibo Observatory is the
23 role in the economic landscape of the
24 Island, specifically in the impact on the
25 tourism industry, the development of our

1 Aerospace Cluster, and its broader impact
2 on the development of a STEM workforce on
3 the Island. The Aerospace Cluster is part
4 of the economic recovery strategy of the
5 Government of Puerto Rico, aimed at
6 integrating aerospace manufactures,
7 providers, and related institutions to
8 develop strategies and foster synergies
9 that will enhance the business environment
10 in the areas where cluster members conduct
11 their operations.

12 Virtually overnight, Puerto Rico has
13 become a magnet for some of the world's
14 leading aviation and aerospace companies.
15 With a long history of manufacturing
16 expertise and a strong pipeline of
17 engineering talent, the Island has
18 attracted multimillion-dollar investments
19 by these and other major firms during
20 recent years. The Arecibo Observatory is
21 part of Puerto Rico, part of these
22 strategies, and a key asset for the
23 development of this aerospace cluster.

24 The many activities implemented by the
25 Education and Public Outreach component of

1 the Arecibo Observatory evidence the
2 broader impact of this research facility,
3 which meets the goals of the Agency to
4 broaden the participation of
5 underrepresented groups in STEM
6 initiatives.

7 Since October 2, 2011, the Ángel Ramos
8 Foundation Science and Visitor Center has
9 hosted more than 450 thousand visitors,
10 approximately 30 percent of these are
11 school children. In addition, the
12 activities hosted have included the
13 Saturday Academy for high school students,
14 REU, observations nights, research
15 opportunities as part of the undergraduate
16 capstone/practicum courses from various
17 local higher education institutions, and
18 mentoring for theses in master and PhD
19 levels.

20 In addition, the creation of the
21 Arecibo Observatory Council of Chancellors
22 and Stakeholders has enabled different
23 universities to come together to use,
24 promote, and create, innovate programs to
25 broaden opportunities for students across

1 the Island to become part of a national
2 recognized research institution. These
3 opportunities create the real, meaningful
4 pathways that increase the STEM workforce.

5 The Agency-preferred Alternative
6 includes the deconstruction of over 26
7 buildings at the site. This implies the
8 elimination of the planetary radar and the
9 space and atmospheric science capabilities
10 at the Arecibo Observatory. These actions
11 will negatively impact the promotion of the
12 aerospace cluster and will limit the
13 possibilities of the Arecibo Observatory
14 Management Team to pursue other sources of
15 income for the financial stability of
16 this outstanding research facility.

17 This alternative will also limit the
18 educational research opportunities for
19 undergraduate and graduate students, the
20 space academy, and all active and current
21 educational activities. Furthermore,
22 eliminating most of the housing at the site
23 will reduce the opportunities to host
24 scientists, teachers, and students who
25 avail themselves of these options due to

1 the geographical and logistic challenges
2 related to the location of the site.

3 We feel it is imperative that the DEIS
4 explain in more detail the impact of the
5 alternatives on the EPO component of the
6 Arecibo Observatory, the local economy, and
7 the science that only occurs at Arecibo.
8 The Agency-preferred Alternative will most
9 likely negatively impact the possibilities
10 of obtaining funds from the private sector
11 and from other federal agencies, such as
12 NASA.

13 UMET, as well as the Puerto Rico
14 Council of Chancellors and Stakeholders of
15 the Arecibo Observatory, strongly believes
16 that the option for a sustainable and
17 productive future for the Arecibo
18 Observatory is to maintain the site with
19 multiple capabilities. Our vision of the
20 Arecibo Observatory is one that will
21 continue supporting the STEM pipeline in
22 Puerto Rico and the economic development of
23 the Island.

24 MR. GAUME: Here's what we are going
25 to do. We have 45 minutes left. I went

1 out and checked with the hotel management,
2 and we have a hard cut-off at 12:30.

3 We really want to hear from everybody.
4 So if you spoke last night and you're
5 giving the exact, same comments today's,
6 your comments are in the official record
7 and will be considered. I'd really like
8 you to consider giving your time to other
9 people that didn't speak last night. But
10 that's totally up to you.

11 What we will be doing is at
12 12:30 -- once we get to 12:30, we will cut
13 off the meeting because we have to get out
14 of this room. So speakers that we don't
15 get to by 12:30, we will ask you to submit
16 your comments through email or regular
17 mail. As Kristen mentioned before,
18 comments that are submitted by email or
19 through mail and oral comments have equal
20 weight in the process.

21 MS. HAMILTON: John Kelly is next, and
22 Ryan Lynch is on deck.

23 MR. KELLY: All right. I'll be quick.

24 My name is John Kelly. I'm with SRI
25 International, and I'm the Arecibo

1 Observatory Principle Investigator.

2 We do welcome the opportunity to
3 provide comments on NSF's Draft
4 Environmental Impact Statement, and we
5 believe that we can provide important
6 perspectives that should be included in the
7 final version. We will, of course, provide
8 written comments within the period.

9 The first and most important point is
10 that the Draft EIS does not cover the
11 specific scenario of operational changes
12 that we describe in our response to the
13 NSF's Dear Colleague Letter. That scenario
14 is one that we consider the most desirable,
15 the most practical, and the most likely to
16 be successful. That's the scenario we
17 first described to NSF four years ago.
18 It's entirely viable; it addresses NSF's
19 needs; it is well known throughout the
20 community and at NSF. Instead, the Draft
21 EIS considers, and NSF has adopted as the
22 Agency-preferred Alternative, a scenario so
23 unlikely as to render the whole result
24 irrelevant.

25 You already heard about the NASA

1 issue. The NASA requirement I already
2 mentioned absolutely requires the
3 continuation of the Observatory's globally
4 unique planetary radar. Every scenario
5 should be submitted and should be
6 considered for the future assumes that the
7 NASA involvement continues. Yet the
8 Agency-preferred Option includes the
9 demolition of that radar's power supply,
10 without which there would be no planetary
11 radar, which brings me to the second point.

12 The NSF has announced in a further
13 Dear Colleague Letter its intention to
14 solicit proposals for the future operation
15 of the Arecibo Observatory and to require
16 those inputs before the Final EIS is
17 published and before deciding and
18 publishing its Record of Decisions. This
19 improper order of events suggests that
20 potential solicitation will require
21 proposers to bid on an unknown.

22 Formal requirements for a record of
23 decision require that an EIS has been
24 prepared for all considered alternatives.
25 So clearly there is something unsuitable

1 with the time order here. Either the
2 Record of Decision should precede the
3 solicitation so that proposers know what
4 they are proposing for or the proposal
5 should have been collected before the EIS
6 was undertaken. As it is, only the
7 scenarios in today's EIS appear to be
8 qualified. And, as we've already said,
9 that specifically excludes the current
10 management's vision.

11 MS. HAMILTON: Ryan Lynch, followed by
12 Brett Isham.

13 MR. LYNCH: (To the interpreter) I'll
14 also give you my comments to read
15 afterwards, if that's okay.

16 So my name is Ryan Lynch. I'm a
17 member of the North American Nanohertz
18 Observatory for Gravitational Waves. I
19 have some additional comments to read after
20 what I already said last night.

21 Sections 3.2 and 3.9 of the Draft EIS
22 define the reach of influence for cultural,
23 employment, economic and income impacts too
24 narrowly. Astronomer across the U.S. and
25 the world depend on open skies access to

1 Arecibo for their research careers. Any
2 scenario that reduces the amount of time
3 available for scientific research
4 negatively impacts the incoming employment
5 of this user group and diminishes the
6 scientific and cultural landscape of the
7 U.S. as a whole. So I ask that this be
8 considered in the Final EIS.

9 Also, Sections 3.9.3 and 4.9 reference
10 students and researchers at colleges and
11 universities when assessing educational
12 impacts. The assumptions that this group
13 would not be negatively impacted under
14 Scenario 1 are erroneous. Any reduction in
15 open-sky time will impact students who use
16 the telescope for research, unless they can
17 come with their own funding. So I also ask
18 that this be considered.

19 I would also like to echo the call to
20 include broader impacts in the Final EIS.
21 Arecibo is an incredible resource for
22 underrepresented students, particularly
23 Hispanic students. An example of this is
24 the Arecibo Remote Command Center, which
25 was started at the University of Texas

1 Brownsville, and it's now expanding
2 nationwide. NSF rightly requires the use
3 of funds to address the broader impacts of
4 their work and the EIS should do the same.

5 Finally, I would like to say that we
6 understand the challenges that NSF faces
7 with its budget and NANOGrav wants to
8 support Arecibo as much as they can. But
9 finding a long-term funding stream takes
10 time and potential donors would grow
11 uncertainty regarding the capabilities and
12 the resources that are available.
13 Expecting a multimillion-dollar committee
14 when systems like the radar and the
15 administration buildings are slated for
16 removal, even if it is only a preliminary
17 proposal, is still an official document in
18 the public record.

19 Expecting donors to come forth in this
20 situation is unrealistic, and I ask that
21 the deadline for proposals per new
22 operations be delayed until after the EIS
23 is finalized. This solicitation should
24 also make clear that these buildings may
25 not ultimately be removed.

1 Thank you.

2 MS. HAMILTON: So that the math works
3 out, when you hear the chimes we're going
4 then move to translation of whatever has
5 been said. So we will have chimes going
6 off at two minutes. Thank you.

7 Brett Isham, and Dr. Daniel Altschuler
8 will be next.

9 MR. ISHAM: I'm Brett Isham from Inter
10 American University. My comments are my
11 own.

12 I'm disappointed that NSF did not plan
13 this meeting better. It started 25 minutes
14 late and now you're pressuring people to
15 hurry up their comments and cutting off
16 people who probably still would want to
17 comment. And I think this is --

18 THE INTERPRETER: You don't have it
19 written down?

20 MR. ISHAM: Not very well. I can
21 hardly read my own notes.

22 THE INTERPRETER: Okay. Then, we
23 would have to go back and forth with this.

24 MR. ISHAM: And I think this is
25 representative of the entire process. It

1 seems to me to be so much wrong in the
2 Draft EIS. I echo the comment from last
3 night that if you read it yourself -- it's
4 hardly a first draft. And it can even be
5 interpreted as a deliberate attempt to
6 sabotage the Arecibo Observatory.

7 NSF is cherry-picking comments from
8 the various reports that is citing. It's
9 ignoring the recommendation of the 2012
10 Astronomy Portfolio Review to reevaluate
11 the science later in the decade. And how
12 can it include the science from the 2015
13 AGS review when that's not finished yet?

14 There have been many comments about
15 astronomy, including NANOGrav, the
16 planetary radar, and I can't go into
17 details. But the atmosphere radar is by
18 100 times the most sensitive in the world.
19 Anyone who has visited similar atmosphere
20 radars around the world knows first-hand
21 that the radar at Arecibo is the most
22 flexible and hands-on atmosphere radar
23 laboratory in the world.

24 NSF appears to be ignoring its own
25 guidelines to consider equally intellectual

1 merit and broader impact.

2 One thing I said last night is that
3 what better, broader impact than an
4 observatory in the United States,
5 especially when there is 22 thousand
6 students visiting every year, 99 percent of
7 whom are Hispanic. NSF wants to promote
8 the study of science.

9 It is a disappointment to me that all
10 these types of comments must be in the
11 context of an environmental impact
12 statement. In summary, it is my feeling
13 that all of this has little do with
14 scientific merit or broader impact but has
15 to do with politics inside the NSF.

16 MS. HAMILTON: Daniel Altschuler, and
17 after that José Castro.

18 MR. GAUME: Let me interrupt just for
19 a second.

20 This is the last thing I'm going to
21 say on the subject. This is your meeting;
22 this is your opportunity to get the
23 comments into the public record.

24 The overwhelming majority of comments
25 that I have heard today so far are already

1 in the public record, which robs the
2 subsequent people that didn't talk last
3 night from getting their comments into the
4 public record. I would encourage you, if
5 you're repeating comments from last night,
6 that you give your time to people that
7 didn't talk last night.

8 Thank you.

9 MR. ALTSCHULER: I didn't talk last
10 night.

11 I am Daniel Altschuler. I am the
12 former director of the Arecibo Observatory.
13 I have a statement which is co-signed by my
14 colleagues Dr. Mayra Lebrón, former
15 research associate at the Arecibo
16 Observatory; Dr. Carmen A. Pantoja, who is
17 here, former REU coordinator for the
18 Arecibo Observatory. We all three are now
19 faculty members of the University of Puerto
20 Rico in Río Piedras. This is a brief
21 statement that I wish to enter into the
22 record.

23 The future of the Arecibo Observatory
24 in Puerto Rico is, again, a matter of
25 public discussion. We would like to add

1 with these short comments to that public
2 discussion and clarify a few issues which
3 have confused the public.

4 Our long time association with the
5 Observatory allows us to make the following
6 comments. Although it recently celebrated
7 its 50th anniversary, it continues to serve
8 scientific research in several areas, and
9 in some of them it is a unique instrument.
10 In a 2006 headline, the journal "Nature"
11 declared that Arecibo might be no longer
12 the dish of the day; but, then, it never
13 was. It has always been something of a
14 gourmet dish and definitely something very
15 special. In particular, its radar
16 capabilities are unique and allow important
17 investigations in the areas of atmospheric
18 science and planetary radar.

19 We begin by expressing our
20 disagreement with statements that seem to
21 imply that because it is no longer the
22 largest dish on our planet, being surpassed
23 by the recently inaugurated FAST telescope,
24 the Five-hundred-meter Aperture Spherical
25 Telescope, in China, it has therefore

1 become obsolete. It is still the second
2 largest single dish in the world, mainly
3 serving the U.S. scientific community, and
4 FAST is in China.

5 It is also not true that the SKA, the
6 Square Kilometer Array, being constructed
7 in South Africa and in Australia, makes the
8 Arecibo Observatory obsolete. The SKA is
9 under construction and, at any rate, does
10 not and will not have certain capabilities
11 which Arecibo does have.

12 In particular we wish to point out
13 that even if all that Arecibo could do was
14 planetary radar, this capability is well
15 worth the relatively small budget needed to
16 maintain the Arecibo Observatory open. It
17 is needed to establish the precise orbit of
18 a near-Earth asteroid, which could
19 represent a threat to a region of the Earth
20 in the event of an impact which, although
21 of low probability, is not impossible.
22 Arecibo represents a first line of defense
23 to verify such a threat. An insurance
24 premium of 12 million a year is a real
25 bargain. I remind you that the total NSF

1 budget is about 4.7 billion.

2 Furthermore, it is not just another
3 telescope. It is an international
4 scientific icon and has been designated by
5 the Institute of Electrical and Electronic
6 Engineers, the IEEE, as an important
7 historical milestone of electrical
8 engineering. The American Society of
9 Mechanical Engineers, ASME, declared it a
10 monument of mechanical engineering, both
11 events happening in 2001. It was
12 registered in the National Registry of
13 Historic Places by the U.S. Department of
14 the Interior National Park Service in 2008.

15 Closing or decommissioning have
16 therefore implications which go beyond
17 strictly scientific matters, since
18 attention must also be given to Section 106
19 of the federal code for the protection of
20 historical sites. Many of our colleagues
21 agree that closing the Arecibo Observatory
22 is a bad move. Changes in its operations
23 will also have significant consequences
24 beyond the issues mentioned above,
25 including a negative effect on the already

1 gloomy economic situation of Puerto Rico.

2 We think that the preferred option by
3 NSF of finding partners for funding the
4 Observatory must be looked upon with some
5 concern, especially if the idea is to offer
6 the Observatory to the local government,
7 likely through the University of Puerto
8 Rico. The alternative of transforming the
9 Observatory into an educational institution
10 is also not a good one and just another way
11 to find local money for a federal facility
12 mostly used by U.S. scientists. The
13 telescope is not an adjunct to the
14 educational activities; it is exactly the
15 opposite.

16 Furthermore, aside from its scientific
17 value, the Arecibo Observatory has served
18 as inspiration and training ground for many
19 Puerto Rican students who have very limited
20 local opportunities to do so. Some of them
21 went on to obtain their doctoral degrees in
22 science. If NSF wants to further the
23 participation in STEM by minorities and
24 women, closing the Observatory or limiting
25 the operation is, again, a bad idea.

1 Thank you very much.

2 MS. HAMILTON: Next is José Castro,
3 followed by Joan Schmelz.

4 MR. CASTRO: Good morning. My name is
5 José Castro. I'm the business innovation
6 officer for the Puerto Rico Industrial
7 Development Company, which is a government
8 agency. Today, on behalf of Ms. Ortiz, who
9 is our executive director, we'll enter some
10 comments.

11 First of all, I wish to point out that
12 the Puerto Rico Industrial Development
13 Company Business Developing Program was
14 very successful in attracting companies,
15 mostly benefited by the Arecibo
16 Observatory. Closing this research
17 institution will not serve the interest of
18 the people of Puerto Rico and it would be a
19 setback in establishing this sector as a
20 main contributor in the economic
21 development of the Island.

22 For many years the Arecibo Observatory
23 stood proud but somewhat isolated from the
24 economic development of the Island. But in
25 2007 the stakeholders began to incorporate

1 the research capability of the institution
2 to attract innovation-driven companies,
3 mostly in aerospace. In 10 years the
4 industry grew from less than one thousand
5 employees to five thousand employees. This
6 doesn't include indirect jobs.

7 Today, it is anticipated that this
8 sector will double the number employees in
9 a five-year period. Companies in the space
10 subsectors will contribute the most and are
11 the ones that require support to receive
12 communications from the satellites as well
13 as space weather data and analytics to
14 assist in their missions. The Arecibo
15 Observatory has the capability and the
16 talent to assist in this new breed of
17 companies looking at space for
18 commercialization.

19 We certainly understand the National
20 Science Foundation's financial concerns in
21 keeping the facility open for research and
22 education. But the center has been both a
23 symbol and a driver for innovation to many
24 Puerto Rican students in their pursue of
25 science and engineering knowledge.

1 Therefore, it is important to reinvent
2 the business model of the center to meet
3 the challenges of the scientist community
4 and to become active participants of the
5 business-innovation community. Closing is
6 not the answer. Changes must be
7 instituted. New services and educational
8 activities must be incorporated. PRIDCO
9 supports Alternative 1. With a new and
10 sustainable operation of the Arecibo
11 Observatory, in a manner consistent with
12 the principle of the National Science
13 Foundation, in a short period of time the
14 center will flourish and will continue to
15 be an economic development tool for the
16 betterment of Puerto Rico and human kind.

17 (Whereupon, Mr. Castro reads his
18 comments in Spanish.)

19 MS. HAMILTON: Joan Schmelz, followed
20 by Kevin Shocket.

21 MS. SCHMELZ: My name is Joan Schmelz.
22 I'm the deputy director of Arecibo
23 Observatory. Today I speak to you as the
24 former chair of the Broadening
25 Participation Working Group at the Math and

1 Physical Sciences Directorate at NSF.

2 Unconscious bias permeates our culture
3 and our science. We all undervalue the
4 scientific contributions of women. Over
5 the past five years almost 50 percent of
6 the Arecibo astronomy telescope time went
7 to women principal investigators. May I
8 suggest that Arecibo science is
9 underappreciated because these
10 contributions from women are undervalued?

11 The Draft EIS does not consider the
12 socioeconomic impact of this pervasive
13 bias. A study needs to be conducted to
14 evaluate the impact of this bias.

15 (Whereupon, an audience member reads
16 in Spanish Ms. Schmelz' comments.)

17 MS. HAMILTON: Kevin Shocket.

18 MR. SHOCKET: Good afternoon.

19 The Arecibo Observatory is a Puerto
20 Rican national treasure and every
21 possibility that could save it should be
22 explored.

23 While it may have been surpassed by
24 newer facilities and more efficient
25 facilities, its unique capabilities and

1 location make the telescope worthy of
2 preserving. Every measure should,
3 regardless of the outcome, be taken to save
4 the facility and can continue to be a
5 source of important scientific and cultural
6 significance and inspiration.

7 Let us not see the telescope fall into
8 the same state of Puerto Rico's 360 degree
9 lighthouse system, which was built during
10 the late 1800s. This system protected the
11 maritime traffic in and around Puerto Rico.
12 And now, with the Arecibo telescope
13 protecting the planet from asteroids, let's
14 not let history repeat itself. Many of
15 these lighthouses are now abandoned and in
16 disrepair. Don't let the same happen to
17 our national treasure.

18 Thank you.

19 MS. HAMILTON: Thank you.

20 I'm very happy to say that everybody
21 who signed up to speak did get a chance to
22 speak today. Thank you for your
23 understanding.

24 We need to close the meeting now, but
25 this was a draft environmental impact

1 statement. We will now consider your
2 comments and improve the Draft
3 Environmental Statement. And, again, any
4 comments, including these or in addition to
5 these can be submitted via this email
6 address (showing on the slide) or via mail
7 through December 12.

8 Thank you so much. We really
9 appreciate your participation.

10 (Whereupon, the public meeting
11 concludes at 12:31 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.

ALEJANDRA DOMÍNGUEZ MENÉNDEZ