

## CONSORTIUM AGREEMENT

THIS AGREEMENT is entered into between the University of Washington, Seattle, Washington, the University of Chicago, Chicago, Illinois, New Mexico State University, Las Cruces, New Mexico, Princeton University, Princeton, New Jersey, and Washington State University, Pullman, Washington (hereinafter individually "Member" and collectively "the Members" or "the Universities);"

### RECITALS

WHEREAS, the Universities each have campus research and educational programs in the astrophysical sciences requiring access to the most modern optical telescope technology;

WHEREAS, access to existing large optical telescopes is inadequate to meet the educational and observational needs of the Universities;

WHEREAS, each of the Universities wishes to participate in the design, construction, and operation of a telescope or telescopes designed to better accommodate campus research and education programs;

WHEREAS, the Universities believe that the study of astronomy will be benefited by the construction and operation of a large, well-equipped, easily accessible, state of the art telescope with an aperture of up to 3.5 meters;

WHEREAS, the Universities wish to participate in, and contribute to, the national effort to develop new design, lightweight, optically efficient telescopes and instruments;

WHEREAS, a new and properly designed telescope can be utilized directly by the Universities from their respective campuses in new ways never before exploited in astrophysical educational and observational programs;

WHEREAS, the Universities desire to enter into an agreement to design, construct and operate such a telescope;

WHEREAS, the Universities have located a superior site for such a telescope at Sacramento Peak in the state of New Mexico, to be known as the Apache Point Observatory (hereinafter "Apache Point Observatory" shall refer to telescope, instrumentation and related site facilities);

WHEREAS, the Universities have, through their representatives, held a number of meetings;

WHEREAS, the Universities have executed a statement of intent to form a consortium and each of the Universities has made available \$20,000 to develop such a consortium in expectation of the benefits to accrue from having access to the proposed Apache Point Observatory;

WHEREAS, the Universities have each made a commitment of a capital contribution (hereinafter "Initial Capital Contribution") toward the design and construction of the Apache Point Observatory;

WHEREAS, the Universities intend to seek external funds to help in the design and construction of the telescope and related facilities and are currently preparing a proposal to obtain such funding;

NOW, THEREFORE, in consideration of the mutual covenants contained herein, it is agreed as follows:

#### CONSORTIUM

1. Subject to the terms and conditions set forth herein, the Universities hereby establish an educational and research Consortium (hereinafter "The Consortium") to be known as the Astrophysical Research Consortium, or ARC, for the design, construction, and operation of one or more advanced technology large telescopes and related support buildings and instrumentation to be located in the Sacramento Peak area of New Mexico and to be known as the Apache Point Observatory.
2. Additional members may be added to The Consortium or current membership assigned under such terms and conditions as shall be unanimously agreed upon by the Members.

#### GOVERNANCE

3. The governing body of The Consortium shall be known as the Board of Governors (hereinafter "Board") and shall consist of two governors from each Member to be named by the president of that Member. At least one of the governors designated by each Member shall be a scientist with knowledge of an area or areas relevant to the activities of The Consortium.

4. The Board of Governors shall come into being upon the execution of this Agreement and shall be responsible for carrying out this Agreement.

*Unanimous*  
*Vote required for*  
*1) new members*  
*2) by laws*  
*3) expulsion*

5. All decisions of the Board shall be by majority vote of the votes cast with at least three Members concurring except as otherwise stated in this Agreement. If the two governors of a Member split on a vote, the Member will not be deemed to be "concurring" for purposes of determining whether three or more Members concur. Each governor shall cast one-half of the votes that the Member appointing that governor is determined to have. A written proxy of a governor may be voted by another governor or by a designated alternate representative of the Member.

6. The majority of governors shall constitute a quorum of the Board.

7. Until completion of design and construction each Member shall have a weighted vote in matters relating to The Consortium; the weight of a Member's vote shall be in proportion to the ratio of its Initial Capital Contribution to the total of all Members' Initial Capital Contributions as set out in paragraph 15 below.

8. Upon completion of design and construction of the Apache Point Observatory on a date set by the Board and for a period of three years thereafter each Member shall have a weighted vote in matters relating to the operation of The Consortium which is proportional to the ratio of its Actual Capital Contribution to the Actual Capital Contributions of all Members. "Actual Capital Contribution" is the total of cash and in-kind property contributed by a Member and accepted and valued by the Board prior to the completion of the design and construction. Thereafter, at three-year intervals, the Board shall redetermine the vote to be accorded to each Member so that it is proportional to the ratio of the Member's Total Contribution to the Total Contribution of all Members to date. "Total Contribution" means the sum of all capital and operating payments of a Member.

9. The Universities through the Board of Governors shall cause to be formed a Washington not-for-profit corporation ("Corporation") to carry out the functions of The Consortium and to hold the assets of The Consortium. The Board of Governors of The Consortium shall also serve as the Board of the Corporation and references to "Board" throughout this Agreement shall mean both.

10. The Board shall adopt by-laws consistent with this Agreement. The by-laws and any amendments to those by-laws must be adopted unanimously by the Board.
  
11. The Board shall select a chairman and other officers. The Board shall appoint a staff Director of the Observatory (hereinafter "Director"). The Director shall report to the Board of Governors. The Director shall serve at the pleasure of the Board for a specified term. The Director shall be responsible for coordinating the design and construction of the Apache Point Observatory and, when completed, for the operation of the Observatory, including the scheduling of observing time in accordance with paragraph 23 below and any other duties that the Board may determine.
  
12. The Board of Governors shall meet as needed, but at least annually, initially to approve the plans and funding for design and construction of the Apache Point Observatory and thereafter to approve the annual operating budgets of the Observatory and to consider any other issues raised by the Director or by the Board. The Board may enter into such contracts, purchase agreements, leases, easements, and other legal arrangements and relationships as are otherwise lawful and as it deems necessary to fulfill the purposes of this Agreement. The Board is authorized to accept such

gifts and grants as it deems will support the purposes of this Agreement and to submit proposals for the support of The Consortium as it deems appropriate. These responsibilities/authorities, other than the approval of the annual budget and the selection of the Director and the setting of the Director's term of service, may be delegated by the Board as it deems appropriate.

13. The Members' responsibilities for the design and construction of the Apache Point Observatory shall be determined by the Board.

#### SCIENTIFIC ADVISORY COMMITTEE

14. There shall be a Scientific Advisory Committee to advise the Director on matters relating to the operation of the Apache Point Observatory. Each Member shall designate one representative to serve on the Scientific Advisory Committee. Representatives shall be permitted to bring non-voting guests. The Director shall chair the Scientific Advisory Committee. The Committee shall meet at least semi-annually and more frequently if requested by the Director. Representatives shall be designated to serve for a term of three years.

CAPITAL AND OPERATING CONTRIBUTIONS

15. Each Member agrees to contribute to the Consortium the following proportionate share of total Members' Initial Capital Contribution.

University of Washington	31.250%
University of Chicago	31.250%
New Mexico State University	15.625%
Princeton University	15.625%
Washington State University	6.250%

*Handwritten notes:*  
1.1M 1,200,000  
1.1M  
2.10  
2,000 246,8  
3,200,000 3,000,000

The total Members' Initial Capital Contributions shall not exceed ~~\$3,200,000.~~

*Handwritten:*  
~~3,950,000~~  
5,450,000

16. Each Member shall be obligated to meet its Initial Capital Commitment on a schedule which is set by the Board. In setting the schedule, the Board will consider each member's schedule of raising such funds.

17. Capital contributions shall consist of all contributions whether money or in-kind contributions. In-kind contributions can include, as needed, personnel services, equipment, and building space. The Board will determine whether to accept such capital contribution and the value of the capital contribution. State law may require that title of



certain property contributed by a Member remain with the Member or the state. Authority to accept and value all property provided on or after January 1, 1983 will rest with the Board.

18. During the construction phase, no Member may be required to contribute more than its agreed upon Initial Capital Contribution, as set out in paragraph 15.
  
19. If any Member contributes additional capital, which contribution is of value to and available to all Members, the value of such a contribution will be included in determining the contributing Member's participating vote at the next regular review. Acceptance and valuation of any additional capital contributions will be subject to Board approval. No additional capital contribution will be credited to a Member for purposes of determining observing time or voting rights until the contribution is actually received by The Consortium. The Board shall determine when such contribution is received.
  
20. Operating expenses are those costs incurred in the day-to-day operation of the Observatory during the operations phase as determined by the Board.

21. Each Member of The Consortium shall be responsible for payments to The Consortium to meet annual operating expenses of The Consortium, less any external operating support The Consortium might obtain, in an amount and on a schedule as approved by the Board of Governors. The Board shall be responsible for valuing any in-kind contributions for operating expenses. Each Member annually shall be responsible for the same proportion of the annual operating expenses as the ratio of its Actual Capital Contribution was to the total Actual Capital Contributions of all Members. Any increase in the annual operating expenses more than 30% over the previous year's annual operating expenses as approved by the Board must be unanimously approved.

USE OF APACHE POINT OBSERVATORY

22. All facilities utilized in common by the Members of The Consortium shall be used, operated, and maintained in a manner compatible with the purposes and functions of The Consortium. Any use or modification of the facilities by individuals or by Member or nonmember institutions which affects or potentially affects the quality, utilization, effectiveness, or the cost of operating these facilities or the site, will be subject to the approval of the Board.

23. Subject to the limitations of paragraph 24 below, each Member annually shall be allocated by the Director an amount of observing time which is in the same proportion to the total available Members' observing time as the ratio of the Member's Total Contribution is to the Total Contributions of all Members. The Director, with the approval of the Board, shall subtract from the total time available for observing such time as he may believe necessary for maintenance in addition to an agreed upon amount of Director's discretionary time not to exceed 7% of the total observing time. The remaining time shall be the Members' observing time. The Director shall schedule, in consultation with the Scientific Advisory Committee, the actual observing times of each Member.
24. Notwithstanding any additional capital contributions made by a Member and accepted by the Board, the annual observing time of a Member as established based upon such Member's Actual Capital Contribution shall not during this Agreement be reduced more than 10% below the percentage level of the Actual Capital Contribution without that Member consenting to the reduction. This means that a Member that is allocated 25% of the observing time based upon its Actual Capital Contribution may not be reduced below 22.5% without the Member's consent. This is, of course, provided that the Member continues to meet its required contributions to annual operating expenses.

25. The Board shall periodically establish rates for use of the telescope. A Member may assign part or all of its observing time to another institution so long as the rate charged does not exceed the rate established by the Board. The Member will remain fully responsible for the conduct of the assignee. Any assignment must be consistent with the educational and research purposes of The Consortium and its Members. The Board of Governors may overrule any assignment which in its judgment is not consistent with The Consortium's purposes.
26. It is the intent of the Members that all decisions relating to the Apache Point Observatory and the use of special instrumentation are to be made in a collegial manner with the advice of the Scientific Advisory Committee. Any dispute among members shall be resolved by the Board.

#### DISSOLUTION AND WITHDRAWAL

27. This Agreement may be terminated and The Consortium dissolved upon a majority vote of the Members with at least four Members concurring. Upon such termination and dissolution the total assets (including dedicated property) acquired by The Consortium shall be liquidated, all debts of The Consortium will be paid,

and any remaining funds or property will be distributed to the Members, as consistent with relevant federal and state law, in accordance with the ratio of each Member's Total Contribution to the Total Contribution of all Members.

28. At dissolution of The Consortium, a Member owning dedicated property may elect to reclaim such property at its fair market value not to exceed its original cost in lieu of cash or other Consortium assets of equivalent value to which the Member is entitled. A former Member will be entitled to either the return of any dedicated property or the cash value of that property. The cash value shall be the depreciated value of the property based upon a depreciation schedule to be adopted by the Board. The Board shall decide whether to return the property or its cash value to the former Member.
29. If the external funding sought by The Consortium does not become available or is not available in a sufficient amount to carry on this project as originally proposed and some of the Members decide to continue the project, a Member may withdraw by advising the Chairman of the Board of Governors of its intent to do so in writing within 90 days after being notified by the Board that the expected external funding is not available or not available in sufficient amount. Upon

such withdrawal, the amount of any capital contribution actually paid by such Member which exceeds its agreed upon proportional participation of the actual expenditures of all Members as set out in paragraph 15 shall be refunded to the Member. Any withdrawing Member that has contributed less than its agreed upon proportional amount of actual expenditures to the date of withdrawal will be liable for the remaining balance of the proportional amount of these already incurred expenditures.

30. Upon completion of the construction of the telescope and facility, any Member may, upon eighteen months' notice to the Board of Governors, withdraw from The Consortium. A withdrawing Member shall be obligated to pay for its prorated share of operating expenses up to the actual date of withdrawal. The withdrawing Member may not remove any assets of The Consortium without the consent of the Board of Governors.

31. If the Board determines that a Member is in breach of this Agreement, it may, by unanimous vote, the governors from the charged Member not voting, expel such Member from The Consortium. No Member may be expelled without first receiving a written statement of default and a reasonable time to correct that default and an opportunity to appear before the Board to respond to the statement of default.

32. Such action of expulsion shall be without prejudice to The Consortium seeking recovery against the expelled Member of any and all obligations which may be due from the expelled Member at the time of expulsion.
33. Such action of expulsion shall be without prejudice to the Member alleged to be in breach seeking redress and adjudication of its rights in the courts.
34. Any Member who withdraws or is expelled from The Consortium shall not be entitled to recover any capital, purchased property, or operating contributions it has made, unless such withdrawal is within the terms of paragraph 29. At the end of 15 years' date from the withdrawal or expulsion, the withdrawing or expelled Member will be entitled to either the return of any dedicated property the Member contributed to the Consortium or its cash value. The Board shall determine whether to return the property or to pay cash value for the property. The cash value shall be the depreciated value of the property based upon a depreciation schedule to be adopted by the Board. Upon withdrawal or expulsion, a former Member will remain obligated to pay any contributions to The Consortium which are due and owing at the time of withdrawal. A former Member's access to the Apache

Point Observatory will be the same as any other non-member.

35. The Consortium shall retain the right to full use of all dedicated property even if the owner of such property withdraws or is expelled from The Consortium, except that the withdrawing or expelled Member may elect to provide equivalent replacements or cash in lieu of allowing continued use of its dedicated property. Prior to such substitution the Board must approve the identity and value of any substituted property.

#### LIABILITY

36. The Consortium shall have primary responsibility for Consortium personnel and property. Each Member shall have primary responsibility for such Member's personnel and property.

#### AMENDMENT

37. This Agreement may be amended only by unanimous consent of the Members.



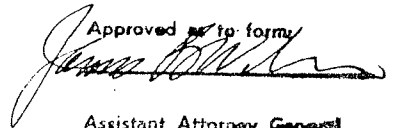
EXECUTION

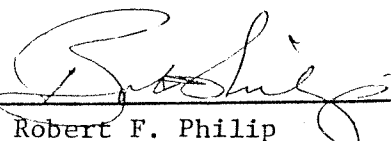
38. This Agreement may be executed in any one or more counterparts, each of which shall be deemed to be an original instrument, but all of which together shall constitute but one instrument.

39. The effective date of this Agreement shall be the 1<sup>ST</sup> day of JANUARY, 1984.

IN WITNESS WHEREOF the parties, through their authorized representatives, have executed this Agreement on the date shown opposite their signatures.

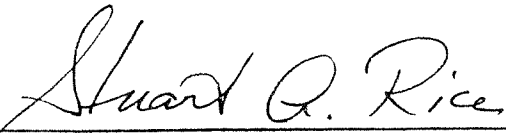
UNIVERSITY OF WASHINGTON

Approved *as to form*  
  
Assistant Attorney General  
State of Washington

By   
Robert F. Philip  
President of the Board of Regents

Date January 20, 1984

UNIVERSITY OF CHICAGO

By   
Dr. Stuart A. Rice, Dean  
Division of the Physical Sciences

Date 1/20/84

NEW MEXICO STATE UNIVERSITY

By Gerald W. Thomas Date 1/24/84

Gerald W. Thomas  
President, New Mexico State University

PRINCETON UNIVERSITY

By Allen J. Sinisgalli Date Jan 20 1984

Allen J. Sinisgalli  
Director, Office of Research  
and Project Administration

WASHINGTON STATE UNIVERSITY

By C. J. Nyman Date 12 Jan 1984

Dean of the Graduate School and  
Associate Provost for Research

Amendment No. 1  
to  
Consortium Agreement

between

University of Washington, University of Chicago, New Mexico State  
University, Princeton University and Washington State University

This Amendment No. 1 is made and entered into the 28th day of  
February, 1986.

WHEREAS, the Consortium Agreement was signed by authorized  
representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 15 of the Consortium Agreement sets forth the  
total Members' Initial Capital Contributions and fixes that total at a level  
not to exceed \$3,200,000;

WHEREAS, the Members' now wish to increase that total to a level  
which does exceed \$3,200,000;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that  
the Agreement may be amended by unanimous consent of the Member

NOW, THEREFORE, the Members agree as follows:

In paragraph 15 of the Consortium Agreement, the dollar amount  
appearing at the end of that paragraph is hereby amended to delete  
"\$3,200,000" and to substitute in its place "\$3,950,000." The remainder of  
paragraph 15 and all other provisions of the Agreement remain unchanged.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 1 on the date shown opposite their signatures.

UNIVERSITY OF WASHINGTON

By: Alan K. Tard Date: 7/7/86

UNIVERSITY OF CHICAGO

By: Norman M. Bradburn Date: 7/30/86

NEW MEXICO STATE UNIVERSITY

By: Dennis W. Darnell Date: April 21, 1986

PRINCETON UNIVERSITY

By: Alfred Seneth Date: April 15-1986

WASHINGTON STATE UNIVERSITY

By: Robert A. Miller Date: May 2 1986

Amendment No. 2  
to  
Consortium Agreement

between

University of Washington, University of Chicago, New Mexico State University, Princeton University and Washington State University

Amendment No. 1 was made and entered into the 28th day of February, 1986.

This Amendment No. 2 is made and entered into the 18th day of February, 1987.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 15 of the Consortium Agreement, as modified by Amendment No. 1, sets forth the total Members' Initial Capital Contributions and fixes that total at a level not to exceed \$3,950,000;

WHEREAS, the Members now wish to increase that total to a level which does exceed \$3,950,000;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

NOW, THEREFORE, the Members agree as follows:

In paragraph 15 of the Consortium Agreement, the dollar amount appearing at the end of that paragraph is hereby amended to delete "\$3,950,000" and to substitute in its place "\$5,450,000." The remainder of paragraph 15 and all other provisions of the Agreement remain unchanged.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 2 on the date shown opposite their signatures.

UNIVERSITY OF WASHINGTON

By: *Tallman Moore* Date: 4/1/87  
Name:  
Title:

Approved as to form:  
*Elsa Richter Cole*  
Elsa Richter Cole  
Assistant Attorney General  
State of Washington

UNIVERSITY OF CHICAGO

By: *Stuart A. Rice* Date: 3/3/87  
Name: Stuart A. Rice  
Title: Dean, Physical Sciences Division

NEW MEXICO STATE UNIVERSITY

By: *John J. Managle* Date: 3/12/87  
Name:  
Title:

PRINCETON UNIVERSITY

By: *Allen J. Smith* Date: 2/25/87  
Name:  
Title:

WASHINGTON STATE UNIVERSITY

By: *Robert A. Nilan* Date: 3/17/87  
Name: Robert A. Nilan  
Title: Dean, Division of Sciences

Amendment No. 03  
to  
Consortium Agreement

between

University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28<sup>th</sup> day of February, 1986, and by Amendment 2 made and entered into the 18<sup>th</sup> day of February 1987,

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to include the Institute for Advance Study as an additional Member;

NOW, THEREFORE, the Members agree as follows:

Effective upon signing of this Amendment No. 3 by all Members, the Institute for Advance Study (IAS) will become a full and equal Member of ARC subject to all applicable provisions of the Consortium Agreement and ARC's By-laws.

The addition of IAS as a Member of ARC is prompted by ARC's commitment to collaborate in the Sky Survey Project (SSP) with a consortium made up of University of Chicago, the Princeton University Observatory, IAS (hereafter referred to as SSP Consortium). The SSP and the ARC/SSP Consortium collaboration are described in the Proposal to ARC dated January 30, 1990. This will involve siting a 2.5 meter telescope at Apache Point for the purpose of conducting a photometric and spectroscopic survey at Northern declinations, and a smaller but more sensitive survey at Southern declinations reachable from Apache Point. This will be a separate facility and separate project distinct from the 3.5 meter telescope project initiated by ARC in 1983. The IAS is not contributing any funds to the 3.5 meter project and will have no guaranteed observing time on that instrument.

In order to effectively manage these two separate projects, two sub-committees of the ARC Board were formed, one to oversee the SSP and the other to oversee the 3.5 meter telescope project. Each of the subcommittees consist of the ARC Members participating in that project with each institutional Member represented by one scientist and one administrator, as on the full Board.

Votes of the subcommittees of the Board and of the Board itself will follow the procedures laid out in the Consortium Agreement and ARC's By-Laws. Namely, in votes on policy issues, each institutional Member will have one vote, with the two institutional representatives casting one-half vote each; in votes on operating budgets, the vote of each institutional Member will be proportional to the contribution of that Member institution to the capital expenses of each project, augmented further, after construction is complete, by its contribution to operating expenses of each project, up-dated every three years.

Allocations of capital and operating expenses specific to each project will require approval of the subcommittee responsible for that project. Allocations of common operating expenses will require approval of both subcommittees and approval of the full Board. The overall budget will then require approval in total by the full Board.

Each subcommittee will choose the Director of the project for which it is responsible and set that Director's term of service, with the choices ratified by the full Board.

The full Board will choose a Site Director who has responsibility for operation of the physical facilities for the benefit of both projects.

The management structure of the SSP will consist of a subcommittee of the Board, a Director, a Scientific Advisory Committee, and several Science Working Groups. The roles of these bodies are spelled out in separate documents which are part of the Agreement between ARC and the SSP Consortium.

The institutional Members of ARC not funding the SSP will have neither legal liability nor financial responsibility for cost overruns in the SSP. However, the full ARC Board will have responsibility for approval of all federal proposals associated with the SSP which invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 3 on the date shown opposite their signatures below.



UNIVERSITY OF WASHINGTON

By: D R Baldwin

Date: December 31, 1990

Name: Donald R. Baldwin

Title: Assistant Provost for Research

UNIVERSITY OF CHICAGO

By: G M Casper

Date: December 19, 1990

Name: Gerhard Casper

Title: Provost

NEW MEXICO STATE UNIVERSITY

Regents of New Mexico State University

By: James E. Halligan

Date: 12/13/90

Name: James E. Halligan

Title: President of the University

PRINCETON UNIVERSITY

By: Allen J. Sinigalli

Date: Dec 3 1990

Name: Allen J. Sinigalli

Title: Associate Provost

WASHINGTON STATE UNIVERSITY

By: Leon J. Radziemski

Date: December 6, 1990  
*- Acting Asst. Vice Pres. Business - 1-2-91*

Name: Leon J. Radziemski

Title: Dean, Division of Sciences

INSTITUTE FOR ADVANCED STUDY

By: Allen I. Rowe

Date: 12/31/90

Name: ALLEN I. ROWE

Title: ASSOCIATE DIRECTOR

Amendment No. 4  
to  
Consortium Agreement

between

University of Washington, University of Chicago, New Mexico State University, Princeton University, Washington State University and Institute for Advanced Study.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28th day of February, 1986, by Amendment No. 2 made and entered into the 18th day of February 1987, and by Amendment No. 3 made and entered into the 31st day of December, 1990;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to include the Johns Hopkins University as an additional Member;

NOW, THEREFORE, the Members agree as follows:

Effective upon signing of this Amendment No. 4 by all Members, the Johns Hopkins University (JHU) will become a full and equal Member of ARC subject to all applicable provisions of the Consortium Agreement and ARC's By-laws.

The addition of JHU as a Member of ARC is prompted by ARC's commitment to collaborate in the Sloan Digital Sky Survey (SDSS) project with a consortium made up of University of Chicago, Princeton University Observatory, IAS, and JHU (hereafter referred to as SDSS Consortium). The SDSS and the ARC/SDSS Consortium collaboration are described in the Proposal to ARC dated January 30, 1990. This will involve siting a 2.5 meter telescope at Apache Point for the purpose of conducting a photometric and spectroscopic survey of the Northern declinations, and a smaller but more sensitive survey at Southern declinations reachable from Apache Point. This will be a separate facility and separate project distinct from the 3.5 meter telescope project initiated by ARC in 1983. The IAS and JHU are not contributing any funds to the 3.5 meter project and will have no guaranteed observing time on that instrument.

In order to effectively manage these two separate projects, two subcommittees of the ARC Board were formed, one to oversee the SDSS and the other to oversee the 3.5 meter telescope project. Each of the subcommittees consist of the ARC Members participating in that project with each institutional Member represented by one scientist and one administrator, as on the full Board.

Votes of the subcommittees of the Board and of the full Board follow the procedures laid out in the Consortium Agreement and ARC's By-laws. Namely, in votes on policy issues, each institutional Member will have one vote, with the two institutional representatives casting one-half vote each; in votes on operating budgets, the vote of each institutional Member will be proportional to the contribution of that Member institution to the capital expenses of each project, augmented further, after construction is complete, by its contribution to operating expenses of each project, up-dated every three years.

Allocations of capital and operating expenses specific to each project will require approval of the subcommittee responsible for that project. Allocations of common operating expenses will require approval of both subcommittees and approval of the full Board. The overall budget will then require approval in total by the full Board.

Each subcommittee will choose the Director of the project for which it is responsible and set that Director's term of service, with the choices ratified by the full Board.

The full Board will choose a Site Director who has responsibility for operation of the physical facilities for the benefit of both projects.

The management structure of the SDSS will consist of a subcommittee of the Board, a Director, a Scientific Advisory Committee, and several Science Working Groups. The roles of these bodies are spelled out in separate documents which are part of the Agreement between ARC and the SDSS Consortium.

The institutional Members of ARC not funding the SDSS will have neither legal liability nor financial responsibility for cost overruns in the SDSS. However, the full ARC Board will have responsibility for approval of all proposals associated with the SDSS which invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 4 on the date shown with their signatures below.

UNIVERSITY OF WASHINGTON

By: Donald R. Baldwin Date: 7-23-92  
Name: Donald R. Baldwin  
Title: Assistant Provost for Research

UNIVERSITY OF CHICAGO

By: Stuart G. Rice Date: 06/26/92  
Name: Dean, Phys. Sciences Division  
Title:

NEW MEXICO STATE UNIVERSITY

The Regents of New Mexico State University

By: James E. Halligan Date: 7-10-92  
Name: James E. Halligan  
Title: President

PRINCETON UNIVERSITY

By: Allen J. Sinigaglia Date: June 25 1992  
Name: Allen J. Sinigaglia  
Title: Assoc. Provost

WASHINGTON STATE UNIVERSITY

By: Leon J. Radziemski Date: June 30, 1992  
Name: Leon J. Radziemski  
Title: Dean, Division of Sciences

INSTITUTE FOR ADVANCED STUDY

By: Allen I. Rowe Date: 6/23/92  
Name: ALLEN I. ROWE  
Title: ASSOCIATE DIRECTOR

JOHNS HOPKINS UNIVERSITY

By: Joseph Cooper Date: July 10, 1992  
Name: Dr. Joseph Cooper  
Title: Provost & Vice President  
for Academic Affairs

Amendment No. 5  
to  
Consortium Agreement

between

University of Washington, University of Chicago, New Mexico State University, Princeton University, Institute for Advanced Study, Johns Hopkins University, and University of Colorado at Boulder.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendments No. 1 through No. 4;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to approve withdrawal of Washington State University and to include University of Colorado at Boulder as an additional Member;

NOW, THEREFORE, the Members agree as follows:

Effective July 1, 2001, Washington State University ceases to be a Member of ARC and University of Colorado at Boulder becomes a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC's By-laws.

The institutional Members of ARC not funding the Sloan Digital Sky Survey (SDSS) will have neither legal liability nor financial responsibility for cost overruns in the SDSS. However, the full ARC Board will have responsibility for approval of all proposals associated with the SDSS which invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 5 on the date shown opposite their signatures.

UNIVERSITY OF WASHINGTON

By: Al Kuiram Date: 7-19-01  
Name: ALVIN L. KUIRAM  
Title: VICE PROVOST FOR RESEARCH

UNIVERSITY OF CHICAGO

By: David W. Oxtoby Date: July 23, 2001  
Name: David W. Oxtoby  
Title: Dean

NEW MEXICO STATE UNIVERSITY

By: E. R. Casillas Date: 7/23/01  
Name: E. Rene Casillas  
Title: Dean, College of Arts and Sciences

PRINCETON UNIVERSITY

By: Allen P. Sinisgalli Date: 7/21/01  
Name: Allen P. Sinisgalli  
Title: Associate Provost for Research & Project Administration

INSTITUTE FOR ADVANCED STUDY

By: Allen I. Rowe Date: July 23, 2001  
Name: ALLEN I. ROWE  
Title: ASSOCIATE DIRECTOR + TREASURER

JOHNS HOPKINS UNIVERSITY

By: Theodore O. Poehler Date: 7/26/01  
Name: Theodore O. Poehler  
Title: Vice Provost for Research

UNIVERSITY OF COLORADO AT BOULDER

By: R. J. Peterson Date: 24 July 01  
Name: R. J. PETERSON  
Title: ASSOCIATE Vice chancellor for RESEARCH

Amendment No. 06  
to  
Consortium Agreement  
between

The University of Washington, The University of Chicago, Princeton University, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, and The Institute for Advanced Study.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28<sup>th</sup> day of February 1986; by Amendment 2 made and entered into the 18<sup>th</sup> day of February 1987; by Amendment No. 3 made and entered into the 31<sup>st</sup> day of December 1990; by Amendment No. 4 made and entered into the 23<sup>rd</sup> day of July 1992; and by Amendment No. 5 made and entered into the 28<sup>th</sup> day of June 2001;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to increase The University of Colorado's 3.5m telescope share from 6.250% to 12.500% by reducing The University Washington's share by 3.125% to 28.125% and reducing The University of Chicago's share by 3.125% to 20.125%;

NOW, THEREFORE, the Members agree that effective January 1, 2006 the following will be the distribution of 3.5m telescope shares between the member institutions:

The University of Washington	28.125%
The University of Chicago	20.125%
Princeton University	15.625%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The Institute for Advanced Study	0.000%

IN WITNESS WHEREOF; the Members, through their authorized representatives, have executed this Amendment No. 6 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: Robert L. Jung  
Date: Divisional Dean, Natural Science 11/14/05  
Title: Divisional Dean, Natural Science

THE UNIVERSITY OF CHICAGO

Name: [Signature]  
Date: Nov. 14, 05  
Title: Dean, Physical Sciences

PRINCETON UNIVERSITY

Name: Scott Tilmanne  
Date: 11/14/05  
Title: CHAIR, ASTROPHYSICAL SCIENCES

Regents of  
NEW MEXICO STATE UNIVERSITY

Name: Robert J. Czerniak  
Date: [Signature] for 11/30/05  
Title: Assistant Vice President of Grants and Contracts

THE UNIVERSITY OF COLORADO

Name: [Signature]  
Date: 11/15/05  
Title: Vice Chancellor for Research & Dean of the Graduate School.

THE JOHNS HOPKINS UNIVERSITY

Name: Therese O. Pechler  
Date: Dec. 3, 2005  
Title: Vice Provost for Research

THE INSTITUTE FOR ADVANCED STUDY

Name: [Signature]  
Date: DEC 5, 2005  
Title: ASSOCIATE DIRECTOR + TREASURER



Amendment No. 07  
10  
Consortium Agreement  
between

The University of Washington, The University of Chicago, Princeton University, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, and The Institute for Advanced Study.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28<sup>th</sup> day of February 1986; by Amendment 2 made and entered into the 18<sup>th</sup> day of February 1987; by Amendment No. 3 made and entered into the 31<sup>st</sup> day of December 1990; by Amendment No. 4 made and entered into the 23<sup>rd</sup> day of July 1992; by Amendment No. 5 made and entered into the 28<sup>th</sup> day of June 2001; and by Amendment No. 6 made and entered into the 14<sup>th</sup> day of November 2005;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to add The University of Virginia as a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, The University of Virginia will acquire a 6.250% share of the 3.5m telescope by reducing The University Washington's share by 3.125% to 25.000% and reducing The University of Chicago's share by 3.125% to 17.000%;

NOW, THEREFORE, the Members agree that effective January 1, 2007 the following will be the distribution of 3.5m telescope shares between the member institutions:

The University of Washington	25.000%
The University of Chicago	17.000%
Princeton University	15.625%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
The Institute for Advanced Study	0.000%

In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS) and SDSS-II projects and facilities at APO. The University of Virginia is not funding the SDSS or SDSS-II and therefore will not have any legal or financial responsibility in the SDSS or SDSS-II. However, all members of the ARC Board share responsibility for approval of all proposals associated with the SDSS or SDSS-II projects that invoke the ARC name.

IN WITNESS WHEREOF; the Members, through their authorized representatives, have executed this Amendment No. 7 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: Paul Z. Marz Date: 10/14/05  
Title: Divisional Dean, Natural Sciences

THE UNIVERSITY OF CHICAGO

Name: [Signature] Date: 11/14/05  
Title: Dean, Physical Sciences

PRINCETON UNIVERSITY

Name: Scott Tremaine Date: 11/14/05  
Title: Chair, Astrophysical Sciences

Regents of  
NEW MEXICO STATE UNIVERSITY

Name: [Signature] Date: 11/30/05  
Title: Robert J. Czerniak, Assistant Vice President of Grants and Contracts

THE UNIVERSITY OF COLORADO

Name: [Signature] Date: 11/15/05  
Title: VC for Research and Dean of the Evans School

THE JOHNS HOPKINS UNIVERSITY

Name: Theodore O. Toepfer Date: Dec. 2, 2005  
Title: Vice Provost for Research

THE UNIVERSITY OF VIRGINIA

Name: Konny W. Denton Date: JAN 30, 2007  
Title: EXEC VP & CHIEF OPERATING OFFICER

THE INSTITUTE FOR ADVANCED STUDY

Name: [Signature] Date: DEC 5, 2005  
Title: ASSOCIATE DIRECTOR & TREASURER

Amendment No. 08  
to  
Consortium Agreement  
between

The University of Washington, The University of Chicago, New Mexico State University, The University of Colorado at Boulder, The University of Virginia, The Johns Hopkins University, and The Institute for Advanced Study.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28th day of February 1986; by Amendment 2 made and entered into the 18th day of February 1987; by Amendment No. 3 made and entered into the 31st day of December 1990; by Amendment No. 4 made and entered into the 23rd day of July 1992; by Amendment No. 5 made and entered into the 28th day of June 2001; by Amendment No. 6 made and entered into the 14th day of November 2005; and by Amendment No. 7 made and entered into the 14th of November 2005;

WHEREAS, on the 1st of July 2013 Princeton University withdrew as a Member of ARC following the provisions in Article 30, leaving an open share of 15.625% of the ARC 3.5m telescope at Apache Point Observatory;

WHEREAS, The University of Chicago has expressed its intent to withdraw as a Member of ARC on the 31st of December 2014 following the provisions in Article 30, leaving an open share of 17.000% of the ARC 3.5m telescope at Apache Point Observatory;

WHEREAS, the combined open shares in the ARC 3.5m resulting from the withdrawals of Princeton University and The University of Chicago amount to 32.625%;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to add Georgia State University Research Foundation, Inc., as a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, Georgia State University Research Foundation, Inc., will acquire a 6.250% share of the ARC 3.5m telescope, reducing the open share from 32.625% to 26.375%;

WHEREAS, ARC will manage the open share of 26.375% on behalf of the Members, to lease to other institutions per separate agreements approved by the Members, or to make available to additional new Members to ARC to be reflected in future Amendments;

NOW, THEREFORE, the Members agree that effective January 1, 2015 the following will be the distribution of 3.5m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
The Institute for Advanced Study	0.000%
Held by ARC on behalf of its Members	26.375%

In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS), and SDSS-IV projects and facilities at APO and the 0.5m ARCSAT telescope. Georgia State University Research Foundation, Inc., is not funding the SDSS or SDSS-IV and therefore will not have any legal or financial responsibility in the SDSS or SDSS-IV. However, all members of the ARC Board share responsibility for approval of all proposals associated with the SDSS or SDSS-IV projects that invoke the ARC name.

IN WITNESS WHEREOF; the Members, through their authorized representatives, have executed this Amendment No. 8 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: Werner Stuetzle Werner Stuetzle  
2014.10.28 02:24:41 -07'00' Date: \_\_\_\_\_  
Dr. Werner Stuetzle, Divisional Dean of Natural Sciences

THE UNIVERSITY OF CHICAGO

Name: Edward Kolb Date: Oct. 29, 2014  
Dr. Edward (Rocky) Kolb, Dean of the Physical Sciences

NEW MEXICO STATE UNIVERSITY

Name: Jeffrey Brown Date: 10/29/2014  
Dr. Jeffrey Brown, Associate Dean for Research and Graduate Affairs, College of Arts & Sciences

THE UNIVERSITY OF COLORADO

Name: Patricia Rankin Date: 10-29-2014  
Dr. Patricia Rankin, Associate Vice Chancellor for Research

THE JOHNS HOPKINS UNIVERSITY

Name: Timothy Heckman Date: 10/28/14  
Dr. Timothy Heckman, Director, Center for Astrophysical Sciences

THE UNIVERSITY OF VIRGINIA

Name: John Hawley Date: Oct 28, 2014  
Dr. John Hawley, Associate Dean for the Sciences

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

Name: James Weyhenmeyer Date: 11/5/2014  
Dr. James Weyhenmeyer, Chair, GSU Research Foundation, Inc.

THE INSTITUTE FOR ADVANCED STUDY

Name: Scott Tremaine Date: 10/30/2014  
Dr. Scott Tremaine, Astrophysics Professor, School of Natural Sciences

Amendment No. 9  
to  
Consortium Agreement  
between

The University of Washington, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, The University of Virginia, Georgia State University Research Foundation, Inc, and The Institute for Advanced Study.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1 made and entered into the 28th day of February 1986; by Amendment No. 2 made and entered into the 18th day of February 1987; by Amendment No. 3 made and entered into the 31st day of December 1990; by Amendment No. 4 made and entered into the 23rd day of July 1992; by Amendment No. 5 made and entered into the 28th day of June 2001; by Amendment No. 6 made and entered into the 14th day of November 2005; by Amendment No. 7 made and entered into the 14th day of November 2005; and by Amendment No. 8 made and entered into the 10th day of November 2014;

WHEREAS, The Institute for Advanced Study joined ARC per Amendment 3 to the Consortium Agreement on January 2, 1991, as a full and equal Consortium Member subject to all applicable provisions of the Consortium Agreement and By-laws;

WHEREAS, The Institute for Advanced Study joined ARC to take part in the Sky Survey Project (SSP) Consortium, which later became the Sloan Digital Sky Survey, but did not contribute any funds to the 3.5-m telescope project and did not have guaranteed observing time on that instrument;

WHEREAS, The Institute for Advanced Study did take part in the first phase of the SDSS survey (SDSS-I) but chose not to take part in subsequent phases of the SDSS survey and is not a participant in the current SDSS-IV project;

WHEREAS, The Institute for Advanced Study wishes to withdraw from ARC since it is no longer a participant in ARC projects;

WHEREAS, The Institute for Advanced Study will relinquish any claim under Article 28 of the Consortium Agreement to ARC assets that might exist at a future time of dissolution of the Consortium;

WHEREAS, ARC agrees to not hold the Institute for Advanced Study liable for any costs that ARC may incur after December 31, 2015, including those related to a potential future dissolution of the Consortium, and including any costs of any kind shared among Members of the Consortium;

WHEREAS, ARC is willing in this case to waive the 18-month notice period required per Article 30 in the Consortium Agreement for any Member to withdraw from ARC, because the withdrawal of the Institute for Advanced Study from ARC does not affect ARC's ability to operate and fund its current projects;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to the withdrawal of the Institute for Advanced Study from the ARC Consortium effective January 1, 2016;

WHEREAS, The Institute for Advanced Study did not have a share in the ARC 3.5-m Telescope, effective January 1, 2016, the following will remain the distribution of 3.5-m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
Held by ARC on behalf of its Members	26.375%

NOW, THEREFORE, the Members agree as follows:

Effective upon signing of this Amendment No 9 by all Members, the Institute for Advanced Study will withdraw from the Consortium effective January 1, 2016.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 9 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: U Stuetzle Date: 11-9-2015  
Dr. Werner Stuetzle, Divisional Dean of Natural Sciences

NEW MEXICO STATE UNIVERSITY

Name: Jeffrey Brown Date: Nov. 9, 2015  
Dr. Jeffrey Brown, Associate Dean for Research and Graduate Affairs in the College of Arts & Sciences  
JFB

THE UNIVERSITY OF COLORADO

Name: Patricia Rankin Date: 11/9/2015  
Dr. Patricia Rankin, Associate Vice Chancellor for Research

THE JOHNS HOPKINS UNIVERSITY

Name: John P. Toscano Date: 11/9/15  
Dr. John Toscano, Vice Dean for Natural Sciences

THE UNIVERSITY OF VIRGINIA

Name: John Hawley Date: 11/9/15  
Dr. John Hawley, Associate Dean for the Sciences

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

Name: James Weyhenmeyer Date: 11/11/2015  
Dr. James Weyhenmeyer, Chair, GSU Research Foundation, Inc.

THE INSTITUTE FOR ADVANCED STUDY

Name: Scott Tremaine Date: 11/12/15  
Dr. Scott Tremaine, Astrophysics Professor, School of Natural Sciences



Amendment No. 10  
to  
Consortium Agreement  
between

The University of Washington, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, The University of Virginia, and Georgia State University Research Foundation, Inc.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1, made and entered into the 28th day of February 1986; by Amendment No. 2, made and entered into the 18th day of February 1987; by Amendment No. 3, made and entered into the 31st day of December 1990; by Amendment No. 4, made and entered into the 23rd day of July 1992; by Amendment No. 5, made and entered into the 28th day of June 2001; by Amendment No. 6, made and entered into the 14th day of November 2005; Amendment No. 7, made and entered into the 14th of November 2005; Amendment No. 8, made and entered into the 10<sup>th</sup> day of November 2014; and by Amendment No. 9, made and entered into the 9<sup>th</sup> day of November 2015;

WHEREAS, after the addition of the most recent ARC Member, Georgia State University Research Foundation, Inc., a share of 26.375% remained open on the ARC 3.5-m telescope;

WHEREAS, this share was held by the Board on behalf of its Members;

WHEREAS, the Members have agreed to continue to consider addition of new Members to reduce this open share;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to add The University of Oklahoma as a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, The University of Oklahoma will acquire a 6.250% share of the ARC 3.5m telescope, reducing the open share from 26.375% to 20.125%;

WHEREAS, ARC will manage the open share of 20.125% on behalf of the Members, to lease to other institutions per separate agreements approved by the Members, or to make available to additional new Members to ARC to be reflected in future Amendments;

NOW, THEREFORE, the Members agree that effective January 1, 2017 the following will be the distribution of 3.5m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
The University of Oklahoma	6.250%
Held by ARC on behalf of its Members	20.125%

In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS), and SDSS-IV projects and facilities at APO and the 0.5m ARCSAT telescope. The University of Oklahoma is not funding the SDSS or SDSS-IV and therefore will not have any legal or financial responsibility in the SDSS or SDSS-IV. However, all members of the ARC Board share responsibility for approval of all proposals associated with the SDSS or SDSS-IV projects that invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 10 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: Werner Stuetzle Werner Stuetzle  
2016.05.31 13:18:16  
-07'00'

Date: 5/31/2016

Dr. Werner Stuetzle, Divisional Dean of Natural Sciences

NEW MEXICO STATE UNIVERSITY

Name: Jeffrey Brown  
Dr. Jeffrey Brown, Associate Dean of Research, Arts & Sciences College

Date: May 26, 2016

THE UNIVERSITY OF COLORADO

Name: Patricia Rankin  
Dr. Patricia Rankin, Associate Vice Chancellor for Research

Date: 5/26/2016

THE JOHNS HOPKINS UNIVERSITY

Name: John P. Toscano  
Dr. John Toscano, Vice Dean for Natural Sciences

Date: 5/26/16

THE UNIVERSITY OF VIRGINIA

Name: John F. Hawley  
Dr. John Hawley, Associate Dean for the Sciences

Date: 6/7/16

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

Name: James Weyhenmeyer  
Dr. James Weyhenmeyer, Chair, GSU Research Foundation, Inc.

Date: 6/16/16

THE UNIVERSITY OF OKLAHOMA

Name: Byron Burr Millsap  
Regents of the University of Oklahoma, Byron Burr Millsap, Associate Vice President,  
Administration and Finance (Purchasing)

Date: 6-7-16

Amendment No. 11  
to Consortium  
Agreement between

The University of Washington, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, The University of Virginia, and Georgia State University Research Foundation, Inc.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1, made and entered into the 28th day of February 1986; by Amendment No. 2, made and entered into the 18th day of February 1987; by Amendment No. 3, made and entered into the 31st day of December 1990; by Amendment No. 4, made and entered into the 23rd day of July 1992; by Amendment No. 5, made and entered into the 28th day of June 2001; by Amendment No. 6, made and entered into the 14th day of November 2005; Amendment No. 7, made and entered into the 14th of November 2005; Amendment No. 8, made and entered into the 10<sup>th</sup> day of November 2014; and by Amendment No. 9, made and entered into the 9<sup>th</sup> day of November 2015; Amendment No. 10, made and entered into the 7<sup>th</sup> day of June 2016;

WHEREAS, after the addition of the most recent ARC Member, The University of Oklahoma, effective January 1, 2017, a share of 20.125% would remain open on the ARC 3.5-m telescope on January 1, 2017;

WHEREAS, this share is held by the Board on behalf of its Members;

WHEREAS, the Members have agreed to continue to consider addition of new Members to reduce this open share;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to add The University of Wyoming as a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, The University of Wyoming will acquire a 6.250% share of the ARC 3.5m telescope, reducing the open share from 20.125% to 13.875%;

WHEREAS, the receiving party for the University of Wyoming's 6.250% share of the ARC 3.5m telescope will be the University Office of Research and Economic Development;

WHEREAS, ARC will manage the open share of 13.875% on behalf of the Members, to lease to other institutions per separate agreements approved by the Members, or to make available to additional new Members to ARC to be reflected in future Amendments;

NOW, THEREFORE, the Members agree that effective January 1, 2017 the following will be the distribution of 3.5m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
The University of Oklahoma	6.250%
The University of Wyoming	6.250%
Held by ARC on behalf of its Members	13.875%

In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS), and SDSS-IV projects and facilities at APO and the 0.5m ARCSAT telescope. The University of Wyoming is an Associate Member (one faculty Participant slot) in SDSS-IV and its financial and legal responsibilities in SDSS and SDSS-IV remain as defined in the Memorandum of Understanding between ARC and The University of Wyoming related to SDSS-IV, dated 02/05/2014. All members of the ARC Board also share responsibility for approval of all proposals associated with the SDSS or SDSS-IV projects that invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 11 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name: Scott Anderson  
Dr. Scott Anderson, Professor

Date: 7/26/2016

NEW MEXICO STATE UNIVERSITY

Name: Nancy J. Chanover  
Dr. Nancy Chanover, Associate Professor

Date: 7/20/16

THE UNIVERSITY OF COLORADO

Name: Patricia Rankin  
Dr. Patricia Rankin, Associate Vice Chancellor for Research

Date: 7/22/2016

THE JOHNS HOPKINS UNIVERSITY

Name: John P. Toscano Dr.  
John Toscano, Vice Dean for Natural Sciences

Date: 7/20/16

THE UNIVERSITY OF VIRGINIA

Name: John Hawley Dr.  
John Hawley, Associate Dean for the Sciences

Date: 7/20/16

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

Name: James Weyhenmeyer  
Dr. James Weyhenmeyer, Chair, GSU Research Foundation, Inc.

Date: 7/28/16

THE UNIVERSITY OF WYOMING

Name: William Gern  
Dr. William Gern, VP of Research & Economic Development

Date: 07/17/16

Amendment No. 12  
to Consortium  
Agreement between

The University of Washington, New Mexico State University, The University of Colorado at Boulder, The Johns Hopkins University, The University of Virginia, Georgia State University Research Foundation, Inc., The University of Oklahoma, and The University of Wyoming.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1, made and entered into the 28th day of February 1986; by Amendment No. 2, made and entered into the 18th day of February 1987; by Amendment No. 3, made and entered into the 31st day of December 1990; by Amendment No. 4, made and entered into the 23rd day of July 1992; by Amendment No. 5, made and entered into the 28th day of June 2001; by Amendment No. 6, made and entered into the 14th day of November 2005; by Amendment No. 7, made and entered into the 14th day of November 2005; by Amendment No. 8, made and entered into the 10th day of November 2014; by Amendment No. 9, made and entered into the 9th day of November 2015; by Amendment No. 10, made and entered into the 7th day of June 2016; and by Amendment No. 11, made and entered into the 28th day of July 2016;

WHEREAS, after the addition of the most recent ARC Member, The University of Wyoming, effective January 1, 2017, a share of 13.875% would remain open on the ARC 3.5-m telescope on January 1, 2017;

WHEREAS, this share is held by the Board on behalf of its Members;

WHEREAS, the Members have agreed to continue to consider addition of new Members to reduce this open share;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to add Brigham Young University as a full and equal Member of ARC subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, Brigham Young University will acquire a 6.250% share of the ARC 3.5m telescope, reducing the open share from 13.875% to 7.625%;

WHEREAS, ARC will manage the open share of 7.625% on behalf of the Members, to lease to other institutions per separate agreements approved by the Members, or to make available to additional new Members to ARC to be reflected in future Amendments:

NOW, THEREFORE, the Members agree that effective January 1, 2021, the following will be the distribution of 3.5m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
The University of Oklahoma	6.250%
The University of Wyoming	6.250%
Brigham Young University	6.250%
Held by ARC on behalf of its Members	7.625%


In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS), SDSS-IV and SDSS-V projects and facilities at APO, and the 0.5m ARCSAT telescope. Brigham Young University is not funding SDSS-IV or SDSS-V and therefore will not have any financial obligations in the SDSS-IV or SDSS-V projects. However, all members of the ARC Board share responsibility for oversight and approval of all SDSS projects and proposals that invoke the ARC name and the disposition of the SDSS 2.5m telescope, equipment, and infrastructure upon completion of the SDSS projects.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 12 on the dates shown with their signatures.

THE UNIVERSITY OF WASHINGTON

Name:  Date: 06/22/2020  
Dr. Suzanne Hawley, Divisional Dean of Natural Sciences

NEW MEXICO STATE UNIVERSITY

Name:  Date: 06/24/2020  
Dr. James Murphy, Assoc. Dean of Research, College of Arts & Sciences

THE UNIVERSITY OF COLORADO

Name:  Date: 7/12/2020  
92A3EB8C53AC485...

Dr. Terri Fiez, Vice Chancellor for Research & Innovation



THE JOHNS HOPKINS UNIVERSITY

Name: John P. Toscano  
Dr. John Toscano, Vice Dean for Natural Sciences

Date: 7/8/2020

THE UNIVERSITY OF VIRGINIA

Name: John F Hawley 4  
Dr. John Hawley, Associate Dean for the Sciences

Digitally signed by John F  
Hawley 4  
Date: 2020.07.07 14:54:26  
UTC

Date: \_\_\_\_\_

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

Name: Michael Eriksen  
Dr. Sarah Rosen, Associate Dean for the Sciences

Date: 7/05/2020

Dr. Michael Eriksen, Interim Chair of GSURF & Interim VP for Research & Economic Development  
THE UNIVERSITY OF OKLAHOMA

Name: G. Kosmopoulou  
Dr. Georgia Kosmopoulou, Associate Dean for Research

Date: 07/02/2020

THE UNIVERSITY OF WYOMING

Name: Edmund V. Synakowski  
Dr. Edmund Synakowski, VP of Research & Economic Development

Date: 07/01/2020

BRIGHAM YOUNG UNIVERSITY

Name: Gus L. W. Hart  
Dr. Gus L. W. Hart, Dean of the College of Physical and Mathematical Sciences

Date: June 15 2020

Amendment No. 13  
to Consortium  
Agreement between

The University of Washington, New Mexico State University, The University of Colorado Boulder, The Johns Hopkins University, The University of Virginia, Georgia State University Research Foundation, Inc., The University of Oklahoma, The University of Wyoming, and Brigham Young University.

WHEREAS, the Consortium Agreement was signed by authorized representatives of all Members and became effective January 1, 1984;

WHEREAS, paragraph 37 of the Consortium Agreement indicates that the Agreement may be amended by unanimous consent of the Members;

WHEREAS, the Consortium Agreement has been amended previously by Amendment No. 1, made and entered into the 28th day of February, 1986; by Amendment No. 2, made and entered into the 18th day of February, 1987; by Amendment No. 3, made and entered into the 31st day of December, 1990; by Amendment No. 4, made and entered into the 23rd day of July, 1992; by Amendment No. 5, made and entered into the 28th day of June, 2001; by Amendment No. 6, made and entered into the 14th day of November, 2005; by Amendment No. 7, made and entered into the 14th day of November, 2005; by Amendment No. 8, made and entered into the 10th day of November, 2014; by Amendment No. 9, made and entered into the 9th day of November, 2015; by Amendment No. 10, made and entered into the 7th day of June, 2016; by Amendment No. 11, made and entered into the 28th day of July, 2016; and by Amendment No. 12, made and entered into the 12th day of July, 2020;

WHEREAS, after the addition of the most recent ARC member, Brigham Young University, effective January 1, 2021, a share of 7.625% would remain open on the ARC 3.5-m telescope on January 1, 2021;

WHEREAS, The University of Oklahoma acquired a share of 6.25% of the ARC 3.5m telescope on January 1, 2017, as detailed in Consortium Agreement No. 10;

WHEREAS, The University of Oklahoma wishes to increase its share by 4.375%, which is held by the Board on behalf of its Members;

WHEREAS, the Members wish to further amend the Consortium Agreement to record their unanimous agreement to increase the share of The University of Oklahoma, a full and equal Member of ARC, subject to all provisions of the Consortium Agreement and ARC By-Laws;

WHEREAS, The University of Oklahoma will therefore increase its share for the ARC 3.5m telescope from 6.250% to 10.625%, reducing the open share from 7.625% to 3.250%;

WHEREAS, ARC will manage the open share of 3.25% on behalf of the Members, to lease to other institutions per separate agreements approved by the Members, or to make available to additional or current Members of ARC to be reflected in future Amendments;


NOW, THEREFORE, the Members agree that effective January 1, 2023, the following will be the distribution of 3.5m telescope shares between the Member institutions:

The University of Washington	25.000%
New Mexico State University	15.625%
The University of Colorado	12.500%
The Johns Hopkins University	8.000%
The University of Virginia	6.250%
Georgia State University Research Foundation, Inc.	6.250%
The University of Oklahoma	10.625%
The University of Wyoming	6.250%
Brigham Young University	6.250%
Held by ARC on behalf of its Members	3.250%

In addition to the 3.5m telescope at Apache Point Observatory (APO), ARC also manages the Sloan Digital Sky Survey (SDSS), SDSS-V projects and facilities at APO, and the 0.5m ARCSAT telescope. All members of the ARC Board share responsibility for approval of all proposals associated with the SDSS and SDSS-V projects that invoke the ARC name.

IN WITNESS WHEREOF, the Members, through their authorized representatives, have executed this Amendment No. 13 on the dates shown with their signatures.

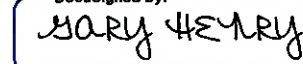
DocuSigned by:  
THE UNIVERSITY OF WASHINGTON

Name:  Date: 11/18/2022  
Dr. Daniel Pollack, Divisional Dean of Natural Sciences

DocuSigned by:  
NEW MEXICO STATE UNIVERSITY

Name:  Date: 11/18/2022  
Dr. James Murphy, Associate Dean of Research, College of A&S

DocuSigned by:  
THE UNIVERSITY OF COLORADO

Name:  Date: 11/18/2022  
Dr. Victor Bright, Associate Vice Chancellor for Research Innovation

THE JOHNS HOPKINS UNIVERSITY

Name: B. Garcia-Moreno Date: Nov 7, 2023  
Dr. Bertrand Garcia-Moreno, Vice Dean for Natural Sciences

THE UNIVERSITY OF VIRGINIA

DocuSigned by:  
Name: Laura Galloway Date: 11/17/2022  
Dr. Laura Galloway, Associate Dean for the Sciences and Research, College of A&S

GEORGIA STATE UNIVERSITY RESEARCH FOUNDATION, INC.

DocuSigned by:  
Name: Timothy Denning Date: 11/17/2022  
Dr. Timothy Denning, VP for Research and Economic Development

THE UNIVERSITY OF OKLAHOMA

Name: Georgia Kosmopoulou Date: 11/04/2023  
Dr. Georgia Kosmopoulou, Associate Dean for Research, Dodge Family College of A&S

THE UNIVERSITY OF WYOMING

DocuSigned by:  
Name: Parag Chitnis Date: 11/28/2022  
Dr. Parag Chitnis, VP for Research & Economic Development

BRIGHAM YOUNG UNIVERSITY

DocuSigned by:  
Name: Eric G Hintz Date: 11/17/2022  
Dr. Eric Hintz, Associate Department Chair, Physics and Astronomy