

ASTROPHYSICAL RESEARCH CONSORTIUM

A Washington Not-for-Profit Corporation

BY-LAWS

Recitals

In January, 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into an agreement (Consortium Agreement) to establish an educational and research Consortium ("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.

The Consortium Agreement states in part: that "The governing body of The Consortium shall be known as the Board of Governors ("Board")"; that "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"; that "The Board of Governors of The Consortium shall also serve as the Board of the Corporation and references to "Board" shall mean both"; and that "The Board shall adopt By-laws consistent with the Consortium Agreement."

The Consortium Agreement will be the source of guidance in management and operation of the Corporation when guidance is needed beyond that provided by these By-laws and Articles of Incorporation. Any inconsistency between the Consortium Agreement and these By-laws shall be resolved in favor of the Consortium Agreement.

ARTICLE I

Name, Location and Purpose

SECTION 1. The name, location of principal office and purposes of the Corporation shall be set forth in the Articles of Incorporation and said Articles are hereby made a part of these By-laws.

ARTICLE II

Member Institutions

SECTION 1. Initial Members. The initial Members of the Corporation shall comprise 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).

SECTION 2. New Members. New Members may be added or current membership assigned under such terms and conditions as shall be unanimously agreed upon by the current Members.

SECTION 3. Expulsion. A Member found to be in default of its obligations to the Corporation may be expelled by the unanimous vote of all Governors of the Board other than the Governors appointed by the member institution found to be in default. No Member shall be expelled without first receiving a

written statement of default endorsed by a majority vote of the Board and being given a reasonable time to correct the default or to appear before the Board to respond to the statement of default.

ARTICLE III

Board of Governors

SECTION 1. Powers. The affairs of the Corporation shall be conducted under the authority of the Members through the Board of Governors (Board). To this end and without limitation of the foregoing or of its powers expressly conferred by these By-laws, the Board shall have power to authorize such action on behalf of the Corporation, make such rules or regulations for its management, create such additional offices or special committees and select, employ or remove such of its officers, agents or employees as it shall deem best. The Board shall have the power to fill vacancies in, and change the membership of such committees as are constituted by it.

SECTION 2. Composition. The Board shall be composed of two members from each of the member institutions, at least one of whom shall be a scientist with knowledge of an area or areas relevant to the activities of the Corporation.

SECTION 3. Term of Office. Each member of the Board shall continue in office for a term of three years, until his or her successor is chosen, or until he or she dies, resigns or is removed by the member institution that appointed him or her. A Governor may serve only so long as he or she is employed by the member institution that appointed him or her.

SECTION 4. Resignation. Any Governor may resign at any time by giving written notice to the Chairman or Secretary of the Corporation. Such resignation shall take effect at the time of receipt of the notice, or at any later time specified therein.

SECTION 5. Alternate Governors. A member institution may appoint from within the member institution an alternate Governor to serve for the term specified by such appointment. In the absence of a Governor from any meeting of the Board, his or her alternate may, upon written notice to the Secretary of the Corporation from the Governor or from a duly authorized representative of the member institution of the Governor, attend such meeting and exercise all the rights, powers and privileges of the absent Governor.

ARTICLE IV

Meetings of the Board of Governors

SECTION 1. Annual Meeting. The annual meeting of the Board for the transaction of such business as may properly come before it shall be held during the month of October in each year, on such date as the Board shall designate.

SECTION 2. Special Meetings. Special meetings of the Board may be called by the Chairman of the Board and shall be called by the Secretary upon the written request of all Governors from any two member institutions.

SECTION 3. Place of Meetings. The Chairman of the Board shall designate the place of the annual meeting or any special meetings, which may be either within or without the State of Washington and which shall be specified in the notice of the meeting.

SECTION 4. Notice of Meetings. Notice of any meeting of the Board shall be given to each Governor by the Secretary, or by an officer directed by the Chairman of the Board to give such notice, by delivering to him or her personally, or by first-class mail, postage prepaid, addressed to him or her at the address of his or her member institution, a written notice not less than ten days before the date fixed for the meeting. The notice will include an agenda for the meeting and new items may be added to the agenda if requested by any Governor. When a meeting is adjourned to another place or time, it shall not be necessary to give any notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken.

SECTION 5. Quorum. Except as may be otherwise expressly required by law, the Certificate of Incorporation or these By-laws, at all meetings of the Board the presence of Governors eligible to cast a majority of the votes eligible to be cast by the entire Board shall constitute a quorum. If a quorum is not present, the Governors present by a majority of the votes cast may adjourn the meeting until a quorum is present. At any duly adjourned meeting at which a quorum is present, any business may be transacted which might have been transacted at the meeting as originally called.

SECTION 6. Voting.

a) Except as otherwise expressly required by law, the Certificate of Incorporation or these By-laws, all matters shall be decided by the affirmative vote of a majority of the votes eligible to be cast by Governors present at the time of the vote, provided that a quorum is present and also provided that the Governors appointed by at least three member institutions concur. If the two Governors appointed by a member institution split on a vote, the Governors appointed by that member institution will not be deemed to be "concurring" for

the purposes of this Section.

b) Each Governor shall cast one-half of the votes that the member institution appointing the Governor is determined to have.

c) The vote of each member institution shall be determined in accordance with the Consortium Agreement.

SECTION 7. Action Without a Meeting. Any action by the Board may be taken without a meeting if by mail ballot, or if all members of the Board consent in writing to the adoption of a resolution authorizing the action. The ballots or the resolution and the written consents thereto shall be filed with the minutes of the proceedings of the Board.

SECTION 8. Participation by Electronic Conference. In any meeting of the Board, any one or more Governors may participate by means of a conference telephone or similar communications equipment allowing all persons participating in the meeting to hear each other at the same time. Participation by such means shall constitute presence in person at a meeting.

SECTION 9. Proxies. A Governor may vote a written proxy of another Governor.

ARTICLE V

Officers

SECTION 1. Officers. The officers of the Corporation shall include a Chairman, Vice Chairman, Treasurer, a Secretary and such other officers as the

Board may from time to time establish and elect or appoint. Officers shall be chosen from among the Governors. Any two or more offices may be held by the same person, except that the offices of Chairman and Secretary may not be held by the same person.

SECTION 2. Chairman. The Chairman shall be the principal executive officer of the Corporation. Subject to the direction and control of the Board, he or she shall be in charge of the business and affairs of the Corporation; see that resolutions and directives of the Board are carried into effect except in those instances in which that responsibility is assigned to some other person by the Board and, in general, discharge all duties incident to the office of Chairman and such other duties as may be prescribed by the Board. He or she shall preside at all meetings of the Board. Except in those instances in which the authority to execute is expressly delegated to another officer or agent of the Corporation or a different mode of execution is expressly prescribed by the Board or these By-laws, he or she may execute for the Corporation any contracts, deeds, mortgages, bonds, or other instruments which the Board has authorized to be executed, and may accomplish such execution either under or without the seal of the Corporation and either individually or with any other officer thereunto authorized by the Board, according to the requirements of the form of the instrument. He or she may vote all securities which the Corporation is entitled to vote except as and to the extent such authority shall be vested in a different officer or agent of the Corporation by the Board.

SECTION 3. Vice Chairman. The Vice Chairman shall assist the Chairman in the discharge of his or her duties as the Chairman may direct and shall perform other duties assigned to him or her by the Chairman or by the Board. In the absence of the Chairman or in the event of his or her inability or refusal

to act, the Vice Chairman shall perform the duties of the Chairman and when so acting, shall have all the powers of and be subject to all the restrictions upon the Chairman. Except in those instances in which the authority to execute is expressly delegated to another officer or agent of the Corporation or a different mode of execution is expressly prescribed by the Board or these by By-laws, the Vice Chairman may execute for the Corporation any contracts, deeds, mortgages, bonds or other instruments which the Board has authorized to be executed and he or she may accomplish such execution either under or without the seal of the Corporation and either individually or with any other officer thereunto authorized by the Board, according to the requirements of the form of the instrument.

SECTION 4. Treasurer. The Treasurer shall be the principal accounting and financial officer of the Corporation and may perform other duties assigned by the Chairman or by the Board. If required by the Board, the Treasurer shall give a bond for the faithful discharge of his or her duties in such sum and with such surety or sureties as the Board shall determine.

SECTION 5. Secretary. The Secretary shall record the minutes of the meetings of the Board in one or more books provided for that purpose, see that all notices are duly given in accordance with the provisions of these By-laws or as required by law, be custodian of the corporate records and of the seal of the Corporation, keep a register of the post office address of each member institution which shall be furnished to the Secretary by such member institution, and perform other duties assigned by the Chairman or by the Board. The Secretary shall distribute copies of Board meeting minutes and other pertinent information to all Board members in timely fashion.

SECTION 6. Election and Term of Office. The officers of the Corporation shall be elected or appointed by the Board to serve for terms of three years or until a successor is chosen.

SECTION 7. Resignation. Any officer may resign at any time by giving written notice to the Chairman, the Vice Chairman or Secretary of the Corporation. Such resignation shall take effect at the time of receipt of the notice, or at any later time specified therein.

SECTION 8. Removal. Any officer may be removed by the Board whenever in its judgment the best interests of the Corporation would be served thereby.

SECTION 9. Vacancies. Any vacancy in any office may be filled for the unexpired portion of the term of such office by the Board.

ARTICLE VI

Payments and Distributions

SECTION 1. Compensation. The Board shall have the power to fix the compensation and fees payable to officers and employees for services rendered to the Corporation; provided, however, that no Governor shall be paid any compensation for serving as Governor. However, Governors may be reimbursed for all or part of the expenses incurred in performing duties assigned to them by the Board.

SECTION 2. Distributions. The Corporation shall not distribute any part of its revenue or other assets to its Governors or officers.

ARTICLE VII

Indemnification

SECTION 1. Indemnification. The Corporation shall have the power to indemnify any Governor, officer, employee or agent; provided, however, that the indemnification provided for herein shall apply only upon the determination by the Board that indemnification is proper in the circumstances. Such determination shall be made: (1) by the Board by a majority vote of a quorum consisting of disinterested Governors, or (2) if such quorum is not obtainable, or even if obtainable if a quorum of disinterested Governors so directs, by independent legal counsel in a written opinion. The foregoing right of indemnification shall be in addition to and not exclusive of all other rights to which such Governor, officer, employee or agent may be entitled.

ARTICLE VIII

Termination and Dissolution

SECTION 1. Termination and Dissolution. The Corporation may be terminated and dissolved by a majority vote of the Members with at least four Members concurring. Upon such termination and dissolution the total assets of the Corporation shall be liquidated, all debts paid, and any remaining funds or property will be distributed to the Members consistent with the Consortium Agreement.

ARTICLE IX

Other

SECTION 1. Fiscal Year. The fiscal year of the Corporation shall commence on the first day of January and end on the thirty-first day of the following December.

SECTION 2. Seal. The seal of the Corporation shall be circular in form and shall bear the words and figures: "Astrophysical Research Consortium - Washington 1984" or words and figures of similar import. The form of such seal shall be subject to alteration by the Board.

SECTION 3. Amendments. The power to amend or repeal existing By-laws shall be vested in the Board. Such action shall be exercised only by unanimous vote by the Board. Notice of a proposed amendment and proposed language of the amendment must be distributed in writing to the Board at least 10 days before the meeting at which the proposed changes are to be considered.

Amendment No. 01
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 01;

NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows:

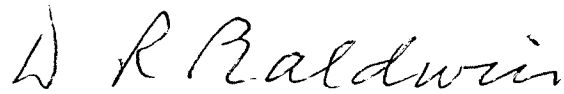
In accordance with Section 2, New Members, the initial members unanimously agreed to add a new member, the Institute for Advanced Study, as confirmed by execution of Amendment No. 3 to the Consortium Agreement.

All other terms of the By-laws remain unchanged.

* * * * *

CERTIFICATE

I, the undersigned, Donald R. Baldwin, hereby certify on this 9th day of January, 1991 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium at its Annual Meeting on November 19-20, 1990, and that Amendment No. 03 has been executed by all six members of the Consortium.



Donald R. Baldwin, Secretary
Astrophysical Research Consortium

Amendment No. 02
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 02;

NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows:

In accordance with Section 2, New Members, the existing members unanimously agreed to add a new member, Johns Hopkins University, as confirmed by execution of Amendment No. 04 to the Consortium Agreement.

All other terms of the By-laws remain unchanged.

* * * * *

CERTIFICATE

I, the undersigned, Donald R. Baldwin, hereby certify on this 31st day of July, 1992 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium at its meeting on June 8, 1992, conducted via telephone conference call, and that the underlying Amendment No. 04 to the Consortium Agreement has been executed by all seven members of the Consortium.

Donald R. Baldwin

Donald R. Baldwin, Secretary
Astrophysical Research Consortium

Amendment No. 03
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 03;

NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows:

In accordance with Section 2, New Members, the existing members unanimously agreed, effective July 1, 2001, to approve withdrawal of Washington State University and to add a new member, University of Colorado at Boulder, as confirmed by execution of Amendment No. 5 to the Consortium Agreement.

All other terms of the By-laws remain unchanged.

* * * * *

CERTIFICATE

I, the undersigned, Donald R. Baldwin, hereby certify on this 26th day of July, 2001 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium by e-mail ballot vote completed June 25, 2001, and that the underlying Amendment No. 05 to the Consortium Agreement has been executed by all seven members of the Consortium.



Donald R. Baldwin, Secretary
Astrophysical Research Consortium

Amendment No. 04
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 04;

NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows:

In accordance with Section 2, New Members, the existing members unanimously agreed November 9, 2005 to add as a new member, University of Virginia, effective January 1, 2007, as confirmed by execution of Amendment No. 07 to the Consortium Agreement.

Article IV, Meeting of thr Board of Governors, Section 1. Annual Meetings, amend the following language:

Delete, “shall be held during the month of October in each year” and replace with “shall be held during October or November in each year”.

Article IV, Meeting of thr Board of Governors, Section 6. Voting, amend the following language:


Delete, “provided that a quorum is present and the Governors appointed by at least three member institutions concur.” and replace with “provided that a quorum is present and the Governors appointed by at least four member institutions concur.”

All other terms of the By-laws remain unchanged.

* * * * *

CERTIFICATE

I, the undersigned, Ronald S. Irving, hereby certify on this 14th day of November, 2005 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium on November 14, 2005 and that the underlying Amendment No. 07 to the Consortium Agreement has been executed by all seven members of the Consortium.



Ronald S. Irving, Secretary
Astrophysical Research Consortium

Amendment No. 05
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, on the 1st of July 2013 Princeton University withdrew as a Member of ARC following the provisions in Article 30 of the Consortium Agreement;

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 of the Consortium Agreement;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 05;


NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows: In accordance with Section 2, New Members, the existing members unanimously agreed October 27, 2014, to approve withdrawal of Princeton University effective July 1, 2013, and to approve withdrawal of The University of Chicago effective January 1, 2015, and to add a new member, Georgia State University Research Foundation, Inc., effective January 1, 2015, as confirmed by execution of Amendment No. 08 to the Consortium Agreement.

All other terms of the By-Laws remain unchanged.

CERTIFICATE

I, the undersigned, Ronald S. Irving, hereby certify on this 6th day of November, 2014, that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium on November 5, 2014, and that the underlying Amendment No. 08 to the Consortium Agreement has been executed by all seven members of the Consortium.



Ronald S. Irving, Secretary
Astrophysical Research Consortium

Amendment No. 06
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 06;


NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows: In accordance with Section 2, New Members, the existing members unanimously agreed June 7, 2016 to approve adding a new member, The University of Oklahoma, effective January 1, 2017, as confirmed by execution of Amendment No. 10 to the Consortium Agreement.

All other terms of the By-Laws remain unchanged.

CERTIFICATE

I, the undersigned, Ronald S. Irving, hereby certify on this 14th day of November, 2016 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium on June 7, 2016 and that the underlying Amendment No. 10 to the Consortium Agreement has been executed by all six members of the Consortium.



Ronald S. Irving, Secretary
Astrophysical Research Consortium

Amendment No. 07
to
BY-LAWS
of
Astrophysical Research Consortium

In January 1984, the University of Washington, the University of Chicago, New Mexico State University, Princeton University, and Washington State University entered into a Consortium Agreement to establish an educational and research 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.

WHEREAS, the Consortium Agreement required that the ARC Board adopt By-laws consistent with the Consortium Agreement;

WHEREAS, such By-Laws were adopted by the Board by unanimous vote via mail ballot in June 1984;

WHEREAS, those By-laws in Article IX, Section 3, Amendments, provide that the By-laws may be amended by unanimous vote of the Board;

WHEREAS, the Board has unanimously voted to approve amendment of those By-laws as set forth in this Amendment No. 07;

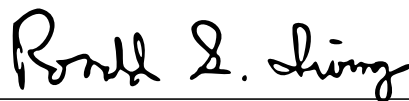
NOW, THEREFORE, the By-laws are amended as follows:

Article II, Section 1, Initial Members, is amended to add new language as follows: In accordance with Section 2, New Members, the existing members unanimously agreed July 28, 2016 to approve adding a new member, The University of Wyoming, effective July 1, 2017, as confirmed by execution of Amendment No. 11 to the Consortium Agreement.

All other terms of the By-Laws remain unchanged.

CERTIFICATE

I, the undersigned, Ronald S. Irving, hereby certify on this 4th day of August, 2016 that the above description of an amendment to the ARC By-laws is a true and correct record of action taken by the Board of Governors of the Astrophysical Research Consortium on July 28, 2016 and that the underlying Amendment No. 11 to the Consortium Agreement has been executed by all seven members of the Consortium.



Ronald S. Irving, Secretary
Astrophysical Research Consortium