SPACE COOPERATION

Space Telescope

Memorandum of Understanding
Between the UNITED STATES OF
AMERICA and the EUROPEAN SPACE AGENCY

Signed at Paris June 18, 2007

NOTE BY THE DEPARTMENT OF STATE

Pursuant to Public Law 89—497, approved July 8, 1966 (80 Stat. 271; 1 U.S.C. 113)—

". . .the Treaties and Other International Acts Series issued under the authority of the Secretary of State shall be competent evidence . . . of the treaties, international agreements other than treaties, and proclamations by the President of such treaties and international agreements other than treaties, as the case may be, therein contained, in all the courts of law and equity and of maritime jurisdiction, and in all the tribunals and public offices of the United States, and of the several States, without any further proof or authentication thereof."

EUROPEAN SPACE AGENCY

Space Cooperation: Space Telescope

Memorandum of understanding signed at
Paris June 18, 2007;
Entered into force June 18, 2007.

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OF THE UNITED STATES OF AMERICA

AND

THE EUROPEAN SPACE AGENCY

CONCERNING THE
JAMES WEBB SPACE TELESCOPE

The National Aeronautics and Space Administration of the United States of America (hereinafter referred to as "NASA"),

and

The European Space Agency, an international intergovernmental organization established by the Convention which was opened for signature in Paris, France, on 30 May 1975 and entered into force on 30 October 1980 (hereinafter referred to as "ESA"),

hereinafter jointly referred to as the "Parties",

PREAMBLE

RECALLING the long standing cooperation between NASA and ESA in the conduct of space science programs, in particular, concerning the Hubble Space Telescope (HST);

WISHING to pursue cooperation on the NASA James Webb Space Telescope mission (hereinafter referred to as "JWST"), previously known as the Next Generation Space Telescope;

NOTING the exchange of letters concluded on 25 September 2000, as extended by the exchanges of letters concluded on 22 August 2005 and 19 October 2006, which established a study-phase agreement to address preliminary activities relating to proposed cooperation on the JWST mission;

CONSIDERING that international cooperation on the JWST mission and, in particular, between NASA and ESA, will enhance the scientific value of the mission and provide mutual benefits;

HAVE AGREED as follows:

ARTICLE 1 - PURPOSE AND OBJECTIVES

1. The purpose of this Memorandum of Understanding (hereinafter referred to as the "MOU") is to define the terms and conditions under which the cooperation between the Parties shall be conducted within the framework of the JWST mission.

2. This MOU is designed to facilitate cooperation between the Parties with respect to the JWST mission. It describes managerial, technical, and operational interfaces between the Parties that are necessary to ensure continuation of, and compatibility between, their respective activities; the roles and responsibilities of the Parties; and the other commitments of the Parties.

ARTICLE 2 - DEFINITIONS

For the purpose of this MOU:

(a) The term "Related Entity" means:

(i) a contractor, subcontractor, or sponsored entity of a Party at any tier;

(ii) a user or customer of a Party at any tier;

(iii) a contractor or subcontractor of a user or customer or sponsored entity of a Party at any tier; or

(iv) a scientific investigator.

The terms "contractor" and "subcontractor" include suppliers of any kind.

For the purpose of Article 16 (Liability), the term "Related Entity" may also include another State or an agency or institution of another State, where such State, agency, or institution is an entity as described in (i) through (iv) above or is otherwise involved in the activities undertaken pursuant to this MOU.

(b) The term "damage" means:

(i) bodily injury to, or other impairment of health of, or death of, any person;

(ii) damage to, loss of, or loss of use of any property;

(iii) loss of revenue or profits; or

(iv) other direct, indirect, or consequential damage.

(c) The term "launch vehicle" means an object or any part thereof intended for launch, launched from Earth, or returning to Earth which carries payloads or persons, or both.

(d) The term "payload" means all property to be flown or used on or in a launch vehicle.

(e) The term "Protected Space Operations" means all activities pursuant to this MOU, including launch vehicle activities and payload activities on Earth, in outer space, or in transit between Earth and outer space. "Protected Space Operations" begin at the entry into force of this MOU and end when all activities done in implementation of this MOU are completed. The term includes, but is not limited to:

(i) research, design, development, test, manufacture, assembly, integration, operation, or use of launch or transfer vehicles, payloads, or instruments, as well as related support equipment and facilities and services;

(ii) all activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.

The term "Protected Space Operations" excludes activities on Earth that are conducted on return from space to develop further a payload's product or process for use other than for the JWST mission.

ARTICLE 3 - MISSION DESCRIPTION

1. The scientific mission of the JWST is to investigate the origin and evolution of galaxies, stars, and planetary systems. The JWST system consists of an infrared-optimized astronomical observatory (hereinafter referred to as the "Observatory"), launched into space by an expendable launch vehicle (ELV) and operated and controlled through ground-based assets. The Observatory is composed of four elements: an Optical Telescope Element (OTE), an Integrated Science Instrument Module (ISIM), a Spacecraft, and a Sunshield.

(a) The OTE is a deployable optical system with diffraction-limited performance in the near-infrared wavelength regime and a stable Point Spread Function (PSF). It is essentially a low-emission, low-scatter telescope for the three Science Instruments (hereinafter referred to as the "SIs") described below.

(b) The ISIM provides the support structure and thermal environment for the SIs Optics Assemblies, plus centralized Command and Data Handling (C&DH) electronics that interface with the SI control electronics. The ISIM houses three SIs and a Fine Guidance Sensor (FGS):

(i) The Near-Infrared Camera (NIRCam), provided by a team led by the University of Arizona;

(ii) A multi-object Near-Infrared Spectrograph (NIRSpec), provided by ESA, will serve as the principal spectrograph;

(iii) The Mid-Infrared Instrument (MIRI), provided jointly by NASA and ESA;

(iv) The FGS, provided by the Canadian Space Agency (hereinafter referred to as the "CSA"), functions as a component of the Spacecraft Attitude and Control System (ACS).

(c) The Spacecraft provides a highly stable pointing platform and housekeeping functions for the Observatory. The spacecraft houses the SIs control electronics and the ISIM Control and Data Handling (IC&DH) electronics.

(d) The Sunshield shades the OTE and ISIM from solar illumination to allow operation with high sensitivity at infrared wavelengths.

2. The planned timeline for the JWST mission is as follows:

- Launch of the JWST	2013
- Required mission duration after commissioning	5 years

ARTICLE 4 - NASA PROGRAMMATIC RESPONSIBILITIES

NASA shall use reasonable efforts to:

1. Design, develop, test, integrate, and deliver to ESA the Observatory for launch in accordance with the Joint Project Implementation Plans (hereinafter referred to as "JPIPs)" defined in Article 6.3 (Management and Documentation);

2. Design, fabricate, test, calibrate, deliver to ESA, and support the Integration and Test (I&T) of the NIRSpec detector system, software, and interconnecting harness and the Micro-Shutter Assembly system, including control electronics, software, and harnesses, for the NIRSpec instrument;

3. Design, fabricate, test, calibrate, and integrate the MIRI cooling system;

4. Design, fabricate, test, calibrate, deliver to ESA, and support the I&T in the MIRI Optical Bench Assembly (hereinafter referred to as the "MIRI OBA") of the flight software and the detector system;

5. Perform all other activities described in the JPIPs as responsibilities of NASA; and

6. Undertake overall responsibility for the on-orbit verification and overall operation of the Observatory, including the operation of the Science and Operations Control (hereinafter referred to as "S&OC") facility for observatory operation, data archive, and distribution.

ARTICLE 5 - ESA PROGRAMMATIC RESPONSIBILITIES

ESA shall use reasonable efforts to:

1. Design, develop, test, integrate, and deliver to NASA the NIRSpec instrument, including supporting models and spare parts;

2. Design, develop, test, integrate, and deliver to NASA the MIRI OBA for the MIRI system, including supporting models and spare parts;

3. Provide standard launch services for the launch of the Observatory with an Ariane 5 ECA ELV, aiming to place the Observatory in a Sun-Earth Lagrange 2 (L2) libration point orbit, in accordance with the JPIPs defined in Article 6.3 (Management and Documentation);

4. Support NASA activities relating to integration of the Observatory to the ELV and launch site operations, as defined in the Launch Vehicle JPIP;

5. Perform all other activities described in the JPIPs as responsibilities of ESA; and

6. Support the operation of JWST as defined in the JPIPs.

ARTICLE 6 - MANAGEMENT AND DOCUMENTATION

1. NASA is responsible for the overall management of the JWST mission.

2. The ESA and NASA Project Managers shall cooperate for the implementation of the Parties' activities under this MOU. Each of the Parties will manage, in accordance with its own rules and procedures, its activities under this MOU.

3. Management details for the activities described in this MOU shall be defined in the JPIPs. The JPIPs shall be jointly developed, agreed upon, and revised as necessary by the ESA and NASA Project Managers and shall be subject to this MOU. The JPIPs shall define the detailed implementing arrangements for the undertakings given in this MOU. The JPIPs may address such items as management and procedural requirements, a list of required documentation, program implementation schedule, technical reviews, applicable standards, verification, and acceptance.

4. The Parties shall provide complete and timely documentation in accordance with the requirements specified in the JPIPs.

5. The working language for all activities under this MOU, including data and information exchanged between the Parties, shall be English.

6. The Project Managers shall meet on a regular basis to review the progress of the implementation of the Parties' respective activities under this MOU and to resolve any issues which may have emerged.

7. Reviews shall be conducted according to agreed upon ESA/NASA procedures and in compliance with the JWST mission schedule.

ARTICLE 7 - EXCHANGE OF PERSONNEL

To facilitate coordination related to the JWST mission, the Parties shall support the exchange of a limited number of personnel members, including contractors and subcontractors, from each Party, at a time and under conditions to be defined in the JPIPs. In the event of such an exchange, the Parties shall provide necessary office space and administrative support at the host location, including such additional support services as may be agreed upon by the NASA and ESA Project Managers. Salary and all other personnel, living, and travel expenses, shall be borne by the employing Party throughout the duration of their assignment in accordance with Article 14 (Financial Arrangements).

ARTICLE 8 - APPORTIONMENT OF OBSERVING TIME

1. The term "observing time" as used in this MOU applies to all investigators selected by the Time Allocation Committee in accordance with Article 9.1 below and means time during which the JWST instruments are in operation, including associated overheads, as defined in the JWST Program Plan established by NASA.

2. JWST observing time shall be made available to investigators from the international scientific community selected in accordance with Article 9 (Selection of Observing Programs) on the basis of the scientific merit of proposals.

3. Subject to Article 8.2, and in consideration of ESA's participation as set forth in this MOU, ESA shall obtain a portion of the observing time on the total complement of scientific instruments of the JWST. This portion will not be less than 15 percent of the observing time on the average over the lifetime of the JWST mission.

ARTICLE 9 - SELECTION OF OBSERVING PROGRAMS

1. A Time Allocation Committee, composed of members of the international scientific community selected in agreement between ESA and NASA, shall review and evaluate all proposals for observing programs to be carried out on the Observatory and make recommendations to the Director of the S&OC facility who, after consultation with NASA and ESA as necessary, shall select proposals for the general observing programs.

2. Should ESA consider that the general observing programs so determined are inconsistent with the provisions of Article 8 (Apportionment of Observing Time), or should there be a major alteration in the ESA participation in the JWST project, ESA may request a joint review which shall evaluate the selection process and recommend corrective actions to be implemented by the Director of the S&OC.

ARTICLE 10 - RIGHTS IN AND DISTRIBUTION OF DATA

1. The Parties shall have access to all data resulting from the mission upon their becoming available.

2. The Selected Investigators shall have access to scientific data obtained by their respective investigations upon their becoming available.

3. Selected Investigators shall have an exclusive first-publication right. The duration of the exclusive right shall be 12 months (hereinafter referred to as the "Restricted Period") from receipt by the Selected Investigators of the JWST data in a form suitable for analysis. The Restricted Period may be reduced by the Director of the S&OC facility with concurrence by NASA, ESA, and CSA based upon experience gained by the international scientific community in the initial years of JWST operations. Investigators may occasionally be requested to share data to enhance efficient utilization of the Observatory and of ground observing operations. Following the Restricted Period, JWST data records, or copies of processed data, shall be deposited with the National Space Science Data Center (NSSDC) and with the S&OC facility and made available to the international scientific community. It is agreed that a listing of all observations shall be published by the S&OC at least every six months in sources readily available to all investigators.

4. The Parties shall have the right to use the data (processed and unprocessed) at any time, in support of their respective responsibilities, and without prejudice to the Selected Investigators' first-publication rights.

ARTICLE 11 - TRANSFER OF GOODS AND TECHNICAL DATA

The Parties are obligated to transfer only those goods and technical data (including software) necessary to fulfill their respective responsibilities under this MOU, in accordance with the following provisions, notwithstanding any other provision of this MOU:

1. All activities of the Parties shall be carried out in accordance with applicable laws, rules, and regulations pertaining to export control and the control of classified information.

2. The transfer of goods and technical data for the purpose of discharging the Parties' responsibilities with regard to interface, integration, and safety shall normally be made without restriction, except as provided in paragraph 1 above.

3. All transfers of export-controlled goods and proprietary or export-controlled technical data are subject to the following provisions. In the event a Party or its Related Entity finds it necessary to transfer export-controlled goods or to transfer proprietary or export-controlled technical data, for which protection is to be maintained, such goods shall be specifically identified and such technical data shall be marked with a notice. The identification for such goods and the marking of such technical data shall indicate that the goods and technical data shall be used by the receiving Party or its Related Entities only for the purposes of fulfilling the receiving Party's or Related Entity's responsibilities under this MOU, and that the identified goods and marked technical data shall not be disclosed or retransferred to any other entity without the prior written permission of the furnishing Party or its Related Entity. The receiving Party or its Related Entity shall abide by the terms of the notice and protect any such identified goods and marked technical data from unauthorized use and disclosure. The Parties to this MOU shall cause their Related Entities to be bound by the provisions of this Article related to use, disclosure, and retransfer of identified goods and marked technical data through contractual mechanisms or equivalent measures.

4. All goods and marked proprietary or export-controlled technical data exchanged in the performance of this MOU shall be used by the receiving Party or its Related Entity exclusively for the purposes of this MOU. Upon completion of the activities under this MOU, the receiving Party or its Related Entity shall return or, at the request of the furnishing Party or its Related Entity, otherwise dispose of all goods and marked technical data provided under this MOU, as directed by the furnishing Party or its Related Entity.

ARTICLE 12 - INTELLECTUAL PROPERTY

1. Nothing in this MOU shall be construed as granting, either expressly or by implication, to the other Party any rights to, or interest in, any inventions or works of a Party or its Related Entities made prior to the entry into force of, or outside the scope of, this MOU, including any patents (or similar forms of protection in any country) corresponding to such inventions or any copyrights corresponding to such works.

2. Any rights to, or interest in, any invention or work made in the performance of this MOU solely by one Party or any of its Related Entities, including any patents (or similar forms of protection in any country) corresponding to such invention or any copyright corresponding to such work, shall be owned by such Party or Related Entity. Allocation of rights to, or interest in, such invention or work between such Party and its Related Entities shall be determined by applicable laws, rules, regulations, and contractual obligations.

3. It is not anticipated that there will be any joint inventions made in the performance of this MOU. Nevertheless, in the event that an invention is jointly made by the Parties in the performance of this MOU, the Parties shall, in good faith, consult and agree within 30 calendar days as to:
   (a) the allocation of rights to, or interest in, such joint invention, including any patents (or similar forms of protection in any country) corresponding to such joint invention;
   (b) the responsibilities, costs, and actions to be taken to establish and maintain patents (or similar forms of protection in any country) for each such joint invention; and,
   (c) the terms and conditions of any license or other rights to be exchanged between the Parties or granted by one Party to the other Party.

4. For any work jointly authored by the Parties, should the Parties decide to register the copyright in such work, they shall in good faith consult and agree as to the responsibilities, costs, and actions to be taken to register copyrights and maintain copyright protection (in any country).

5. Subject to the provisions of Article 11 (Transfer of Goods and Technical Data) and Article 13 (Release of Results and Public Information), each Party shall have an irrevocable royalty-free right to reproduce, prepare derivative works, distribute, and present publicly, and authorise others to do so on its behalf, any copyrighted work resulting from activities undertaken in the performance of this MOU for its own purposes, regardless of whether the work was created solely by, or on behalf of, the other Party or jointly with the other Party.

ARTICLE 13 - RELEASE OF RESULTS AND PUBLIC INFORMATION

1. The Parties retain the right to release public information regarding their own activities under this MOU. The Parties shall coordinate with each other in advance concerning releasing to the public information that relates to the other Party's responsibilities or performance under this MOU.

2. The Parties shall make the final results obtained from the JWST mission available to the general scientific community through publication in appropriate journals or by presentations at scientific conferences as soon as possible and in a manner consistent with good scientific practices.

3. In all media activities, the contributions of each Party to the JWST mission shall be acknowledged.

4. The Parties acknowledge that the following data or information does not constitute public information and that such data or information shall not be included in any publication or presentation by a Party under this Article without the other Party's prior written permission:

   (a) data furnished by the other Party in accordance with Article 11 (Transfer of Goods and Technical Data) which is export-controlled, classified, or proprietary; or
   (b) information about an invention of the other Party before an application for a patent (or similar form of protection in any country) corresponding to such invention has been filed covering the same, or a decision not to file has been made.

ARTICLE 14 - FINANCIAL ARRANGEMENTS

1. Each Party shall bear the costs of discharging its own respective responsibilities under this MOU, including travel and subsistence of its own personnel and transportation of goods and associated documentation, for which it is responsible.

2. The Parties' obligations hereunder are subject to their respective funding procedures and the availability of appropriated funds. Should either Party encounter budgetary problems in the course of its respective internal procedures that may affect the activities carried out under this MOU, that Party shall notify and consult with the other Party in a timely manner in order to minimize the negative impact of such problems on the cooperation.

ARTICLE 15 - CUSTOMS CLEARANCE AND OWNERSHIP

1. In accordance with the laws and regulations governing the Parties, each Party shall facilitate free customs clearance and waiver of all applicable customs duties and taxes for goods necessary for the implementation of this MOU. In the event that any customs duties or taxes of any kind are nonetheless levied on such goods, such customs duties or taxes shall be borne by the Party related to the authority levying such customs duties or taxes. The Parties' obligation to ensure duty-free entry and exit of goods is fully reciprocal.

2. Each Party shall retain ownership of all the goods, hardware, and software, including associated technical data and any Ground Support Equipment (GSE) it provides to the other Party under the terms of this MOU, without prejudice to any individual rights of ownership of the Parties' respective Related Entities.

ARTICLE 16 - LIABILITY

1. The Parties agree that a comprehensive cross-waiver of liability between the Parties and their Related Entities shall further participation in space exploration, use, and investment. The cross-waiver of liability shall be broadly construed to achieve this objective. The terms of the cross-waiver are set out below.

2. (a) Each Party agrees to a cross-waiver of liability pursuant to which each Party waives all claims against the other Party, the other Party's Related Entities, employees of the other Party, or employees of the other Party's Related Entities, based on damage arising out of Protected Space Operations. This cross-waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The cross-waiver shall apply to any claims for damage, whatever the legal basis for such claims, except for claims for damage caused by wilful misconduct.

   (b) Each Party shall extend the cross-waiver of liability to its own Related Entities by requiring them, by contract or otherwise, to agree to waive all claims, and require that their Related Entities waive all claims, against the other Party, the other Party's Related Entities, and employees of the other Party or its Related Entities, based on damage arising out of Protected Space Operations.

(c) For avoidance of doubt, this cross-waiver of liability includes a cross-waiver for any liability arising from the Convention on International Liability for Damage Caused by Space Objects, which entered into force on 1 September 1972 (hereinafter referred to as the "Liability Convention"), where the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations.

(d) Notwithstanding the other provisions of this Article, this cross-waiver of liability shall not be applicable to:

(i) claims between a Party and its own Related Entity or among its own Related Entities;

(ii) claims made by a natural person, his/her estate, survivors, or subrogees (except when a subrogee is a Party to this MOU or is otherwise bound by the terms of this cross-waiver) for bodily injury, other impairment of health, or death of such natural person; or

(iii) intellectual property claims.

(e) This cross-waiver of liability shall not apply to performance of the Parties' obligations under this MOU.

(f) Nothing in this Article shall be construed to create the basis for a claim or suit where none would otherwise exist.

(g) In the event of third-party claims which may arise out of, inter alia, the Liability Convention, the Parties shall consult promptly on any potential liability, on any apportionment of such liability, and on the defence of such claim.

ARTICLE 17 - REGISTRATION, JURISDICTION, AND CONTROL

The Government of the United States shall register the Observatory as a space object in accordance with the 1975 Convention on the Registration of Objects Launched into Outer Space which entered into force on 15 September 1976. NASA shall retain jurisdiction and control over the space objects registered by the United States under this MOU.

ARTICLE 18 - MISHAP INVESTIGATION

In the case of a mishap or mission failure, the Parties shall provide assistance to each other in the conduct of any investigation, bearing in mind, in particular, the provisions of Article 11

(Transfer of Goods and Technical Data). In the case of activities that might result in the death of, or serious injury to persons, or substantial loss of, or damage to, property as a result of activities under this MOU, the Parties shall establish a process for investigating each such mishap as part of their program/project-level implementation plans.

ARTICLE 19 - AMENDMENT

This MOU may be amended by written agreement of the Parties.

ARTICLE 20 - CONSULTATION AND SETTLEMENT OF DISPUTES

The Parties shall consult with each other promptly when events occur or matters arise that may question the interpretation or implementation of the terms of this MOU. Any dispute in the interpretation or implementation of the terms of this MOU shall be first referred to the ESA Coordinator for Astronomy and the NASA Astrophysics Division Director. If necessary, the dispute shall then be referred to the ESA Director of Science and the NASA Associate Administrator for the Science Mission Directorate, or their designees. Any dispute which cannot be resolved at this level shall be referred to the Director General of ESA and the Administrator of NASA, or their designees. Failing agreement at that level, the Parties may agree to submit the dispute to an agreed upon form of dispute resolution.

ARTICLE 21 - ENTRY INTO FORCE, DURATION, AND TERMINATION

1. This MOU shall enter into force upon signature by both Parties. It shall remain in force until 6 years after the launch of JWST, or until 31 December 2019, whichever is earlier, unless extended by written agreement of the Parties, or terminated in accordance with Article 21.2 below.

2. Either Party may terminate this MOU at any time by giving the other Party at least 12 months written notice of its intent to terminate. Termination of this MOU shall not affect a Party's continuing obligations under Article 10 (Rights In and Distribution of Data), Article 11 (Transfer of Goods and Technical Data), Article 12 (Intellectual Property), Article 13 (Release of Results and Public Information), Article 15 (Customs Clearance and Ownership), Article 16 (Liability), and Article 17 (Registration, Jurisdiction, and Control), Article 18 (Mishap Investigation), and Article 20 (Consultation and Settlement of Disputes), unless otherwise agreed upon by the Parties. In the event of termination, the Parties shall endeavor to minimize any negative impact of such termination on the other Party.

IN WITNESS WHEREOF, the undersigned duly authorised representatives of the Parties have signed this MOU, in two originals, in the English language.

Done at Paris this 18th day of June 2007

For the National Aeronautics and Space Administration of the United States of America

MICHAEL D. GRIFFIN
ADMINISTRATOR

For the European Space Agency

JEAN-JACQUES DORDAIN
DIRECTOR GENERAL