BALLOON FLIGHT SUPPORT APPLICATION

Payload Acronym: _____

Payload Name: _____

This form identifies science group requirements for NASA/CSBF Conventional, Long-Duration Balloon (LDB), Super-Pressure Balloon (SPB), and Piggyback (PB) flight support.

Submit applications to CSBF as follows:

TYPE	PREVIOUSLY FLOWN PAYLOADS	FIRST FLIGHT PAYLOADS
Conventional	One to two years prior to requested launch date	Three years prior to requested launch date
LDB/SPB	Three years prior to requested launch date	Three years prior to requested launch date
Piggyback	Six months prior to integration with primary payload	Six months prior to integration with primary payload

Please complete and sign a separate application in as much detail as possible for each individual balloon flight planned and return to:

E-MAIL TO: HUGO.FRANCO@NASA.GOV
SHELBY.ELBORN@NASA.GOV
WFF-CSBF-FLIGHTAPPS@MAIL.NASA.GOV

General instructions and other information regarding this application are contained in support documents available on the CSBF Web site at http://www.csbf.nasa.gov/docs.html. Conventional support documents can be found at http://www.csbf.nasa.gov/convdocs.html, and LDB documents at http://www.csbf.nasa.gov/ldbdocs.html.

PART I FLIGHT TYPE

CONVENTIONAL FLIGHT	
Is this a conventional flight (typically from Palestine, TX or Fort Sumner, NM)?	Yes ☐ No ☐

LDB TEST FLIGHT	
Is this request for an engineering or science validation mission for a future LDB/SPB flight? (An engineering or science validation flight, normally from the continental United States, is considered a conventional balloon flight.)	Yes ☐ No ☐

LDB FLIGHT	
Is this request for a Long-Duration Balloon (LDB) flight?	Yes ☐ No ☐

SPB FLIGHT	
Is this request for a Super Pressure Balloon (SPB) flight?	Yes ☐ No ☐

PIGGYBACK	
Is this a request to fly as a Piggyback on a science flight?	Yes ☐ No ☐

PART II SCIENCE

DISCIPLINES					
Check the discipline applicable to the flight covered by this application.					
Astrophysics Division	☐	IR, Submillimeter, Radio	**Heliophysics Division**	☐	Geospace Sciences
	☐	Cosmic ray, particle		☐	Solar and Heliospheric Physics
	☐	X-ray		☐	Upper Atmosphere Research
	☐	Ultraviolet and Visible	**Solar System Exploration**	☐	
	☐	Gamma-Ray	**Special Projects**	☐	

SCIENCE DESCRIPTION	
Please describe the scientific experiment and its objectives. This description will be used to brief senior NASA officials and in press releases by the NASA Public Affairs Office. It may also be used by CSBF in our outreach and public relations programs. Use layman's terms to the maximum extent possible.	
Description	
Objectives	

PART III CONTACTS

PRINCIPAL SCIENTIFIC INVESTIGATOR			
Principal Scientific Investigator Name			
Organization Name			
Mailing Address			
Telephone Number			
Cell Phone Number			
Fax Number			
E-Mail Address			
Project Web Site		May we link to this site on the CSBF web site?	Yes ☐ No ☐

CO-INVESTIGATOR	
Co-Investigator Name	
Organization name	
Mailing address	
Telephone number	
Cell Phone Number	
Fax number	
E-mail address	

PROJECT OFFICER	
Project Officer or Delegate familiar with engineering aspects of experiment	
Organization name	
Mailing address	
Telephone number	
Cell Phone Number	
Fax number	
E-mail address	

PART IV FUNDING

FUNDING			
NASA SPONSORED		NON-NASA SPONSORED	
NASA Program		Sponsoring Agency	
Sponsoring Directorate		Program	
Science Discipline Chief		Program Executive	

PART V FLIGHT PROFILE

LAUNCH SITE	**ESTIMATED SITE ARRIVAL DATE**	**REQUESTED FLIGHT DATE**

FLOAT REQUIREMENTS		
CRITERIA	MINIMUM	DESIRED
Float Altitude		
Time at Float Altitude		
NOTE: ***Fort Sumner launches are only conducted in the morning. If you require night data collection, a morning launch must be considered when factoring time at float altitude.***		
Altitude Stability		

FLOAT REQUIREMENTS		
CRITERIA	MINIMUM	DESIRED
Launch Time		

OTHER THAN NORMAL FLIGHT PROFILE REQUIREMENTS			
Ascent/descent rates		Valving	
Altitude stability		Other	
Altitude variations		Other	

PART VI MINIMUM SCIENCE SUCCESS CRITERIA

SCIENCE OBJECTIVES	DESCRIPTION	MINIMUM	DESIRED
Briefly state the minimum and desired scientific objectives which must be met to achieve a mission success.			
Provide a summary of the minimum and desired performance for the experiment (detectors, pointing systems, etc.).			

BALLOON AND SUPPORT SYSTEMS	DESCRIPTION	MINIMUM	DESIRED
Provide full details of any pertinent balloon and/or CSBF support systems (telemetry, commanding, recovery, etc.) performance requirements for minimum and desired criteria.			

METEOROLOGICAL SUPPORT	DESCRIPTION	MINIMUM	DESIRED
Provide details on any other data source or support element separate from the balloon flight but necessary to achieve mission success (instrumented sounding balloons, instrumented aircraft, satellite overpass, independent ground station measurements, or National Weather Service radiosonde data).			

PART VII PAYLOAD / GONDOLA DATA

The gondola design documentation available on the CSBF Web site at http://www.csbf.nasa.gov/gondoladocs.html defines NASA certification policies for gondolas and pressure vessels, along with GSFC fastener integrity requirements. Please verify that you have the appropriate documentation and procedures in place to comply with these policies.

PAYLOAD/GONDOLA						
Dimensions of scientific payload (attach drawings or photos if available)	L:		W:		H:	
Estimated weight of scientific payload (only experimenter-supplied equipment including experimenter-supplied batteries)						
Has CSBF flown this payload before? If yes, indicate where, when, and the flight number. **NOTE** **First-time long-duration payloads require a conventional "test flight" prior to an LDB mission.**	Yes ☐ No ☐					
	Date		Flight #		Site	
Have any structural changes been made that affect your previous mechanical and/or pressure vessel certifications?	Yes ☐ No ☐					
	If Yes, explain:					
Are there any restrictions on the proximity of the scientific payload to other equipment, electronics, ballast, or to the balloon?						
Is there anything that will be intentionally released/separated from the payload (e.g., sensor packages, drop articles, etc.)?	Yes ☐ No ☐ If Yes, explain when the item(s) will be intentionally separated from the balloon:					
If Yes, provide the dimensions: (Attach drawings or photos if available, and additional information will be required.)	L:		W:		H:	
If Yes, provide the estimated weight of article to be intentionally released/separated from the payload:						

PART VIII SPECIAL REQUIREMENTS

BALLOON		
X	REQUIREMENT	ADDITIONAL INFORMATION
	No radar-reflective tape	
	Minimum poly powder lubrication	
	Other	

ROTATOR	
Do you plan to fly a pointing rotator / free swivel?	Yes ☐ No ☐
Are you requesting to use the NASA rotator?	Yes ☐ No ☐
Please describe your pointing requirements to include the direction of pointing and duty cycle of pointing for each of your observations or reason for a swivel requirement.	

ROTATOR	
Has this rotator/swivel been previously flown?	Yes ☐ No ☐
When was it last flown?	
When was it last modified?	
When was it last pull-tested?	

HIGH-GAIN ANTENNA (LDB/SPB FLIGHTS)	
Do you plan to fly the NASA high-gain antenna (TDRSS)?	Yes ☐ No ☐

PART IX SAFETY

The *Balloon Flight Application Procedures User Handbook (http://www.csbf.nasa.gov/docs.html)* delineates CSBF policies regarding hazardous materials, systems, and equipment. Please verify that the appropriate documentation and procedures are in place to comply with these policies. You will be given a Verification of Safety Compliance form after your arrival at the launch site and be required to complete it before the payload is ready for flight.

You may be required to generate a special ground and/or flight safety plan to address hazardous conditions. If hazardous materials are used, you must furnish Material Safety Data Sheets (MSDS). Please forward any applicable safety documentation or plans that have been generated as part of your own institutional safety program as part of your project.

Each scientist is required to furnish CSBF with a Sealed Source Device Registry (SSDR) Safety Evaluation Sheet to be on file at CSBF before the source can be shipped to CSBF property or remote launch site. Refer to the *Balloon Flight Application Procedures User Handbook* for instructions regarding radioactive sources.

HAZARDOUS MATERIALS LIST

The table at right lists hazards typically associated with balloon payloads. **Please confirm those that are applicable to this project with Yes, No, or Unknown**.

Please indicate any additional hazardous materials, systems, or equipment not falling into these categories (i.e. toxic gases, super-conducting magnets).

HAZARD TYPE	PALESTINE		LAUNCH SITE	
	Calibration	In Flight	Calibration	In Flight
Chemicals				
Cryogenic materials				
High intensity light source				
High voltage				
Lasers				
Magnets				
Pressure vessels				
Pyrotechnics				
Radioactive materials				
Science Li-ion rechargeable batteries				
Science RF sources				
Ultraviolet light source				
Other				

RADIOACTIVE MATERIALS

List radioactive sources to be used and the maximum activity/wattage. Identify materials in Ci, μCi, and/or nCi.

SOURCE TYPE	ACTIVITY / WATTAGE	
	PALESTINE	LAUNCH SITE

PART X EXPENDABLE SUPPORT REQUIREMENTS

LDB payloads require pre-deployment integration and testing with all flight systems in the "FULL UP" mode to include LDB support systems and Science instruments, electronic systems and any flight computer software. All gondola fabrication must be completed at this time as well. All pre-deployment integration and testing is normally performed at the CSBF facility in Palestine, Texas during July for upcoming Antarctica flights, during March for upcoming Sweden flights, and in November for flights from Wanaka, New Zealand. Please delineate the location (Palestine pre-deployment integration or launch site) when answering the following.

GAS / CRYOGEN ESTIMATE

Estimate the type, purity, container size, PSI, and quantity of compressed gas, cryogens, and specialty gases you expect CSBF will need to order to support your program.

GAS/CRYOGEN	PURITY	CONTAINER SIZE	PSI	QUANTITY DESIRED	
				PALESTINE	LAUNCH SITE

NOTE:

Gas/cryogen estimates you provide on this application are used ONLY for CSBF forecasting and planning purposes; no gas/cryogen order for your program will be generated based on this application form.

Place gas/cryogen orders at least 30 working days before your required delivery date:

1. Download the gas/cryogen order form from the CSBF Web site at http://www.csbf.nasa.gov/bids.html
2. Complete the form.
3. E-mail or fax the form to CSBF:

   E-mail: WFF-DL-CSBF-Cryogens@mail.nasa.gov
   F- Fax: 903-723-8068, ATTN: Cryogens

BALLAST

CSBF normally provides steel shot as ballast. Non-magnetic ballast (sand) may be used if justified by science requirements. Please indicate your requirement.	Steel:	☐	Sand:	☐

OTHER EXPENDABLES		
Other than those directly required by the CSBF for its flight support, expendables must be paid for directly by the experimenter's group or from monies transferred to NASA and made available to the CSBF. The CSBF will assist in determining whether these items are considered routine support. List those items that you expect CSBF to provide for you.	PALESTINE	LAUNCH SITE

PART XI IN-FLIGHT POWER REQUIREMENTS

BATTERIES

CSBF provides primary non-rechargeable lithium batteries for the powering of science instruments. These batteries are primarily used during the Conventional Campaigns (i.e. Fort Sumner). Going forward the nominal 30V unloaded (10 Cell) pack will be the standard. Any other variety will need to be coordinated through the electronics manager. Please email juan.perez@nasa.gov for your non-standard pack needs. Non-standard packs will have longer lead times as they will need to be designed and tested.

Indicate below if you want CSBF to purchase batteries for your scientific payload.

Yes ☐ No ☐

BATTERY	CELLS/PACK	LOADED VOLTAGE	AMPERE HOUR*	QUANTITY DESIRED	
				PALESTINE	LAUNCH SITE
B7901-10	10	26	30		

* De-rate ampere hour ratings for temperatures below -20 degrees Celsius.

NON-CSBF SUPPLIED BATTERIES	
Do you intend to use non-CSBF supplied batteries? If so, please provide the type of battery, number of batteries, rechargeable or non-rechargeable.	Yes ☐ No ☐ If yes, explain:

PHOTOVOLTAIC SYSTEM	
Do you intend to use a photovoltaic (PV) power system? (CSBF does not provide PV power systems for experimenters. However, CSBF can assist you with selection of a vendor for an LDB-suggested PV power system.)	Yes ☐ No ☐

PART XII GROUND SUPPORT

The CSBF has environmental test facilities in Palestine that can be made available for your use during pre-deployment integration. Such services are limited or non-existent at remote launch sites. List any such services you require.

ENVIRONMENTAL TEST FACILITIES (IN PALESTINE ONLY)

NETWORK AND IT REQUIREMENTS		
CSBF normally provides one publicly visible IP for established launch sites (Palestine, Fort Sumner, Australia). Scientists are strongly suggested to provide their own router/firewall to provide connectivity behind the IP.		
NETWORK/IT	**PALESTINE**	**LAUNCH SITE**
Number of static IP addresses		
Number of dynamic IP addresses		
Specific ports required for firewall traversal		
List Operating Systems being used **NOTE:** **EOL OS are not permitted to connect to CSBF provided networks.**		

AC POWER		
List your AC power requirements to include voltage, phase, line frequency, and nominal current. Please identify peak current loads you may impose.	PALESTINE	LAUNCH SITE

LIFT EQUIPMENT	
Do you plan to use your own lifting equipment? If so, please describe what equipment you intend to provide. More information may be required.	Yes ☐ No ☐ If yes, explain:

Science Provided Pressure Regulators	
WFF Certified Pressure Regulators are required. More information will be necessary to obtain approval. CSBF normally does not provide WFF approved regulators. Do you require Certified Pressure Regulators for Gas?	Yes ☐ No ☐ If yes, explain:

PART XIII TELEMETRY AND ELECTRONICS SUPPORT

CONVENTIONAL FLIGHTS

CSBF TELECOMMAND SYSTEM				
The CSBF command system allows for a 16-bit parallel command word and a maximum of 77 discrete commands. Please reconfirm the following information from the Flight Support Abstract. See the *CIP Interface User handbook* at http://www.csbf.nasa.gov/convdocs.html for instructions for command integration.				
Do you plan to use your own command encoder and transmitter to meet science payload requirements?	If yes, please fill out:			
	FREQUENCY	POWER	AUTH. NO.	AREA OF AUTH.

AIRBORNE TELEMETRY			
Indicate the nature of telemetry signals from the scientific instrumentation.	**SIGNAL**	**FREQUENCY (BPS)**	**CODING (NRZ, BIO, ETC.)**
CSBF normally furnishes telemetry transmitters. Do you plan to use your own telemetry transmitter or have any RF emitters (including low-power ISM Band units)?	**FREQUENCY**	**AUTH. NO.**	**AREA OF AUTH.**
Describe special or unusual electronic requirements, indicate constituent signals comprising science furnished composite video, and indicate any TV video requiring CSBF-supplied transmitters.			

GROUND TELEMETRY	
List any special requirements for ground station equipment (i.e. bit syncs, test equipment, special or unusual electronic requirements, and specific voltage signal level or format requirements.	
Downrange ground station support requirements.	

LDB/SPB FLIGHTS

LDB/SPB Telemetry and Electronics support differs from support for Conventional balloon flights. Please refer to the Science Enclosures on the CSBF Web Site (http://www.csbf.nasa.gov/ldbdocs.html) as a guide and reference for completing this section of the flight application form.

TELEMETRY REQUIREMENTS
Please place a check mark in each category for the type of telemetry subsystem you plan to use. Currently, the SIP uses the TDRSS (COMM1) and IRIDIUM (COMM2) subsystems. The Science Stack is normally used for those experimenters who do not have a flight computer of their own with which to interface to the COMM1 and COMM2 science ports (but can be used for redundancy). LOS (Line-Of-Sight) commanding is available through each COMM system over the science ports and to the Science Stack (option). Commanding via the COMM systems is available through the COMM science ports or to the Science Stack.

TELEMETRY REQUIREMENTS

Science flight- and ground-computer interface requirements are provided in Enclosures 8 and 9 respectively. It is understood that the experimenter will arrive at CSBF for pre-campaign integration with interface connectors and proper cable lengths ready for integration. GSE computer and flight computer processing software will also be written, installed, and tested prior to arrival at CSBF.

It is an absolute requirement that the experimenter's GSE computer be at Palestine to receive TDRSS data and send TDRSS commands. Experimenters are responsible for setup and operation of their GSE equipment. Experimenters **are required to use both COMM1 and COMM2** low-rate science ports primarily for commanding redundancy. If the TDRSS link is unavailable, then the IRIDIUM link can be used and vice-versa. Otherwise, there will be no command path once the payload is out of line-of-sight.

LDB SUPPORT INSTRUMENT PACKAGE SUBSYSTEM	CHECK IF YOU INTEND TO USE
TDRSS (Comm1) Low rate science port	☐
TDRSS (Comm1) High science port (6-kbps)	☐
TDRSS (HGA) High science port (up to 92-kbps)	☐
Iridium (Comm2) Low rate science port	☐
Science-dedicated LOS L-Band/S-Band return TM	☐
GSE interface with LDB at the launch site	☐
GSE interface with LDB at the OCC in Palestine, Texas	☐
Science stack interface for housekeeping and commands (option) – required if you need open collector discrete commands from the SIP	☐

AIRBORNE TELEMETRY

LOS (Line-of-Sight) return telemetry via L-Band or S-Band transmitter is offered only during ascent and while within range of the launch site. If you desire to use this support, please provide the information indicated to the right.

NOTE:

It is the responsibility of the science group to provide power, switching, and mounting of the CSBF-supplied transmitter/heat sink plate if the data rate is in excess of 300-kb Biphase encoded data or is NTSC video.

For each 1-Mbit transmitter:

28V DC, +/- 4V, approximately 1.2-amp, weight=7 lbs.

For each NTSC video transmitter:

28V DC, +/- 4V, approximately 2-amp, weight=14 lbs.

SIGNAL	FREQUENCY (BPS)	CODING (NRZ, BIO, ETC.)

CSBF normally furnishes telemetry transmitters. Do you plan to use your own telemetry transmitter?

FREQUENCY	AUTH. NO.	AREA OF AUTH.

Describe special or unusual electronic requirements, indicate constituent signals comprising science furnished composite video, and indicate any TV video requiring CSBF-supplied transmitters.

GROUND TELEMETRY	
List any special requirements for ground station equipment (i.e. bit syncs, test equipment, special or unusual electronic requirements, and specific voltage signal level or format requirements.	

PART XIV OTHER EXPERIMENTERS

If other experimenters are participating with you in the flight(s) covered by this request, please provide their names and organizations.

NAME	ORGANIZATION

If this is a cooperative program, describe each party's degree of involvement:

NAME	INVOLVEMENT

Please provide names of all participants in your group who will be supporting the flight. This list must include all personnel at the launch site. In case of campaigns outside the United States, the CSBF and NASA are required to inform the host country about the nationality of all campaign participants.

FOREIGN NATIONAL SCREENINGS		
Each science team member who is a foreign national must register with CSBF **three months before arrival** at any integration or launch site, domestic or foreign. U.S. Citizens who remain (or plan to remain) on site for longer than 29 days will also be required to provide this information and register **at least one week prior to exceeding 29 days at the facility**. Personnel will not be granted physical access to facilities without the required information.		
NAME	**E-MAIL ADDRESS**	**COUNTRY OF CITIZENSHIP**

PART XV FUTURE REQUIREMENTS

In an attempt to meet the future needs of the scientific community, it is critical that you provide detailed information on any balloon flights planned for the next five years to assist NASA/CSBF in developing flight support services. Considerable advanced planning is required for complicated missions, e.g., Australia, Canada, and Antarctica. Even if you are only thinking about proposing, identifying potential requirements facilitates the planning process. Include the anticipated number of flights and the location and seasonal requirements of each. Also note any special support, services, or capability requirements not presently offered by the CSBF.

IMPORTANT

THIS FLIGHT APPLICATION **MAY NOT BE REUSED** FOR PROJECTED FUTURE FLIGHTS. A SEPARATE FLIGHT APPLICATION MUST BE SUBMITTED FOR EACH FLIGHT.

PAYLOAD NAME	FLIGHT DATE	FLIGHT LOCATION	SPECIAL SUPPORT	ADDITIONAL SERVICES

PART XVI AGREEMENT

I have read and agree with all requirements and conditions set forth in the Balloon Flight Support Application and related handbooks and materials available from the CSBF website.

Name: _____

Organization: _____

Signature: _____

Date: _____

PART XVII CONTACTS

CSBF CONTACTS				
P.O. BOX 319 • PALESTINE, TX 75802 • 903-723-0271				
INFORMATION	**NAME**	**PHONE**	**FAX**	**EMAIL**
General operations, scheduling	Hugo Franco	903-723-8091	903-723-8056	hugo.franco@nasa.gov
Integration, flight dynamics, telemetry, launch, and recovery	Juan Perez	903-731-8549	903-731-8509	Juan.perez@nasa.gov
Gas/cryogen questions and orders	Purchasing	903-729-0271	903-723-8054	csbf-cryogens@lists.hq.nasa.gov
Visitor screening and badges				wff-dl-csbf-badging-services@mail.nasa.gov