National Aeronautics
and Space Administration

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NRA 99-OSS-02

RESEARCH ANNOUNCEMENT

COMPTON GAMMA RAY OBSERVATORY

GUEST INVESTIGATOR PROGRAM

Cycle 9

Proposals Due: **May 6, 1999**

OMB Approval No. 2700-0087

Compton Gamma Ray Observatory
Guest Investigator Program
Cycle 9

NASA Research Announcement
Soliciting Proposals for Basic Research

NRA 99-OSS-02

Release Date: February 1, 1999
Proposal Due Date: May 6, 1999

Office of Space Science
National Aeronautics and Space Administration
Washington, D.C. 20546-0001

COMPTON GAMMA RAY OBSERVATORY
GUEST INVESTIGATOR PROGRAM (Cycle 9)

This NASA Research Announcement (NRA) solicits basic research proposals for participation in the National Aeronautics and Space Administration (NASA) program to analyze scientific data from the *Compton* Gamma Ray Observatory (*Compton* GRO) and to conduct correlative research closely tied to *Compton* GRO observations. This NRA is the ninth announcement for the *Compton* GRO Guest Investigator Program and solicits proposals for Cycle 9 of the mission which will begin in December 1999, and last approximately 18 months. Observing time is available to Guest Investigators during this phase and, in addition, opportunities exist for analysis of data obtained during earlier mission cycles, and for correlative research related to *Compton* GRO observations.

Participation in this program is open to all categories of organizations, both domestic and foreign, including educational institutions, NASA Centers, profit and nonprofit organizations, and other Government agencies. Proposals may be submitted at any time before the stated deadline. Proposals received after that date will be held for the next review cycle. Proposals will be evaluated by a scientific peer review panel with the goal of announcing selections by September 1999.

Limited funds are expected to be available for supporting programs accepted in response to this NRA. The Government's obligation to make awards is contingent upon the availability of appropriated funds and the receipt of proposals which the Government determines are acceptable for award. A proposal that is scientifically and programmatically meritorious but cannot be accepted during its initial review under an NRA because of funding uncertainties may be included in subsequent reviews unless the offeror requests otherwise. Budgets are not to be submitted in response to this solicitation. After the observing program has been determined, NASA will contact investigators whose proposals have been accepted for budget requests. Foreign proposals accepted under this NRA will be implemented on the customary no exchange of funds basis in which NASA and the sponsoring foreign agency will each bear the cost of discharging their respective responsibilities.

At the time of this writing, a total of approximately $0.5M is planned for the support of Guest Investigators during Cycle 9. Additional information is in Appendix D.

Grants in conformance with NASA Grant and Cooperative Agreement Handbook (NPG 5800.1D) dated July 23, 1996, or contracts in conformance with acquisitions regulations will be generated in order to fund successful proposals.

Further details relevant to this program are included in Appendices A-H to this NRA. Requests for paper copies of Appendices F-H should be directed to the *Compton* GRO Science Support Center using the form on page 5 of this NRA.

IDENTIFIER:	NRA 99-OSS-02
PROPOSAL DUE DATE:	May 6, 1999
NUMBER REQUIRED:	15 copies including original
SELECTING OFFICIAL:	Director Research Program Management Division Office of Space Science
SUBMIT PROPOSALS TO:	*Compton* GRO Guest Investigator Program Code 661 Building 2, Room 246 Goddard Space Flight Center National Aeronautics and Space Administration Greenbelt, MD 20771-0001 USA
ADDITIONAL PROGRAMMATIC INFORMATION FROM:	Dr. Louis Kaluzienski CGRO Deputy Program Scientist Office of Space Science Code SR National Aeronautics and Space Administration Washington, DC 20546-0001 (202) 358-0365 or <lkaluzienski@hq.nasa.gov>
DIRECT TECHNICAL QUESTIONS TO:	Dr. Chris Shrader *Compton* GRO Science Support Center Code 661 Goddard Space Flight Center National Aeronautics and Space Administration Greenbelt, MD 20771-0001 USA (301) 286-8434 or <shrader@grossc.gsfc.nasa.gov>
REQUEST PRINTED COPIES FROM:	Sandy Barnes *Compton* GRO Science Support Center Code 661 Goddard Space Fight Center National Aeronautics and Space Administration Greenbelt, MD 20771-0001 USA (301) 286-7780 or <barnes@grossc.gsfc.nasa.gov>

RETRIEVE NRA and APPENDICES ELECTRONICALLY FROM:
<http://www.hq.nasa.gov/office/oss/>, select “Research Opportunities”

NASA appreciates your interest and cooperation in participating in the *Compton* Gamma Ray Observatory Guest Investigator Program.

Alan N. Bunner
Science Program Director
Structure and Evolution of the Universe

LIST OF APPENDICES

Appendices G and H may also be accessed electronically on the World Wide Web at <http://www.hq.nasa.gov/office/oss/ >, select "Research Opportunities."

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[1] This document is out of print; only a limited number of copies are available.

[2] This document is out of print; only a limited number of copies are available. The text (without figures) is available electronically.

If the printed copy of the Appendices below are desired, please fill in your name and mailing address below and indicate which documents you would like to receive.

Please send the following NASA Research Announcement (NRA) documents for the *Compton* Gamma Ray Observatory:

☐ NRA 99-OSS-02 Research Announcement, Cycle 9
Compton Gamma-Ray Observatory Guest Investigator Program

☐ Appendix F: *Compton* Gamma Ray Observatory Science Plan
(September 1991)

☐ Appendix G: The *Compton* Gamma Ray Observatory as a Guest
Investigator Facility (December 1996)

☐ Appendix H: *Compton* Gamma Ray Observatory Project Data
Management Plan (July 1990)

Mail this application to:

Compton GRO Science Support Center
Code 661
Goddard Space Fight Center
National Aeronautics and Space Administration
Greenbelt, MD 20771-0001
USA

Address to which materials are to be mailed (fill in):

IMPORTANT

Summary of significant changes to the program for Cycle 9:

- Cycle 9 will last approximately 18 months, from December 1999 until June, 2001. Subsequent cycles will revert to 12 months. The purpose for extending Cycle 9 is to adjust the relative phasing of the CGRO and Astrophysics Data Analysis Programs.

- The total budget for Cycle 9 grants will be about $0.5M, which is about 60% of the Cycle 8 total. This is the last Cycle for which grant support will be offered through the CGRO Guest Investigator Program. The CGRO Guest Investigator Program is the *only* NASA funding source for CGRO research during the period covered by Cycle 9. Starting in Cycle 10, CGRO research may be funded under the Astrophysics Data Program.

- The use of EGRET in Cycle 9 will be very limited, restricted to exceptional targets of opportunity (ToOs). Approximately 6 weeks of EGRET ToO time will be awarded under this NRA. The exact amount of this awarded time that will ultimately be carried out will be dependent on performance monitoring of the instrument during Cycles 8 and 9.

Other important summary information:

- The proprietary period for all data obtained during Cycle 9 will be 3 months.

- Proposals for analysis of existing data, for new observations, for correlative research and for services to the CGRO community will be considered under this NRA (see Appendix C, sections II.C and III.B). Theoretical investigations will not be supported.

- Page limits and formatting restrictions will be more strictly enforced than in the past. Refer to the guidelines in (Appendix D, section II.B).

- This NRA covers the 18-month period of Cycle 9 only; projects requesting grant support or an observation plan extending for two or more cycles will not be considered.

SUMMARY OF THE *COMPTON* GAMMA RAY OBSERVATORY (*COMPTON* GRO) MISSION AND INSTRUMENTS

I. Mission Objective

The *Compton* Gamma Ray Observatory is studying the various astrophysical processes (e.g., nuclear reactions, electron bremsstrahlung, matter-antimatter annihilation, elementary particle production and decay, Compton scattering, synchrotron radiation, etc.) and sources that produce high-energy electromagnetic radiation. Its observations are addressing a variety of questions relevant to understanding the universe, such as: the formation of the elements; the structure and dynamics of the Galaxy; the nature of pulsars; the existence of black holes; the origin of gamma-ray bursts; energetic and explosive phenomena occurring in galactic nuclei; the origin of the cosmic diffuse background; particle acceleration in the Sun, stars, and stellar systems; processes in supernovae; and the origin and evolution of the universe itself. Its high sensitivity, broad energy coverage, high time resolution, and complementary instrumentation permit discovery of new sources and phenomena in this most energetic region of the electromagnetic spectrum observable from space. Particularly notable is the opportunity for unprecedented high-energy coverage of a complete Solar Cycle afforded by the *Compton* GRO extended mission phase.

The *Compton* GRO was conceived, designed, and developed as a Principal Investigator class observatory, but it is now a Guest Investigator facility accessible to the international astrophysics community. Four distinctly different instruments are optimized to perform simultaneous observations of specific targets or regions. They combine to cover over five decades of energy with more than a factor of 10 improvement in sensitivity, and with improvements in spectral and spatial resolution in selected energy ranges over previously flown instruments. It is important to note that three of the four instruments on *Compton* GRO view large regions of the sky and, therefore, are capable of making observations of several sources simultaneously.

II. Mission Plan

Orbital operations for the *Compton* GRO mission have been divided into four phases sequenced in time, following an initial period of approximately 40 days immediately after launch devoted to checking out the spacecraft and instruments. For a description of the mission phases refer to Appendix C, section II.

III. Operational Characteristics

The *Compton* Gamma Ray Observatory is a large free-flying spacecraft with a total weight of 15900 kg, of which approximately 6000 kg is scientific payload. *Compton* GRO was launched on the Shuttle Atlantis on April 5, 1991, and released into the planned 450-km circular orbit with an inclination of 28.5°. Using onboard propulsion, the altitude is maintained above 350 km to avoid excessive drag and below ~450 km to avoid excessive trapped particle radiation in passing through the South Atlantic magnetic anomaly. Celestial pointing is being maintained with an accuracy of ~0.1°. Attitude determinations are accurate to ~2' and an absolute timing accuracy of ~0.1 msec has been achieved. Experiment data is continuously recorded at a 32 kbit/sec rate during Tracking Data Relay Satellite System (TDRSS) contacts. Typically, *Compton* GRO operates with all four instruments observing all the time, outside regions of the South Atlantic Anomaly. Additional information regarding the data modes for each experiment, the data flow to and at each investigator site, and the hardware and software planned for processing data at each site is contained in Appendix G (available upon request).

In March 1992, the tape recorders on *Compton* GRO began to exhibit unacceptably high noise levels in the playback data, and they are no longer routinely used. In their place, real-time telemetry downlinks have been scheduled through the TDRSS multi-access mode whenever the *Compton* GRO High-Gain Antenna can be pointed at any of the TDRSS spacecraft. The TDRSS was reconfigured in 1993, and an additional ground-tracking station was added in support of *Compton* GRO operations. This has yielded a minimum data recovery rate of approximately 82% since its implementation, with higher rates possible for restricted spacecraft attitudes.

IV. Science Instruments

A summary of the detector characteristics for each instrument is given in Table 1. The sensitivities in Table 1 are based on 5_10^5 seconds exposure on source. With the anticipated 82% coverage rate, this is the exposure time normally obtained in a 2-week observation. A brief description of each instrument is given below. More comprehensive descriptions of the four instruments and their data modes appear in Appendix G. At the time of this writing, all instruments are operating within their nominal performance range, although EGRET is generally operated in a reduced-field-of-view mode to conserve spark-chamber gas (see Appendix G, section IV for details).

A. Oriented Scintillation Spectrometer Experiment (OSSE)

This experiment utilizes four large actively-shielded and passively-collimated Sodium Iodide (NaI) Scintillation detectors, with a 3.8° x 11.4° FWHM field of view. The large area detectors provide excellent sensitivity for both gamma-ray line and continuum emissions from ~0.1 to 10 MeV. Each detector utilizes a single-axis orientation system to implement a source/offset pointing mode of operation that permits background subtraction from celestial source contributions and also allows observation of secondary targets when the primary target is occulted by the Earth. It also permits observations of selected sources, such as transient phenomena and solar flares, without impacting the planned Observatory viewing program. (Principal Investigator: Dr. James D. Kurfess, Naval Research Laboratory, Washington, DC, E-mail: <kurfess@osse.nrl.navy.mil>)

B. Imaging Compton Telescope (COMPTEL)

This instrument operates in the 0.75-30 MeV range. It employs the unique signature of a two-step absorption of the gamma ray, i.e., a Compton collision in the first detector followed by total absorption in a second detector element. This method, in combination with effective charged-particle shield detectors and time-of-flight techniques, results in efficient suppression of the substantial instrumental background. Spatial resolution in the two detectors, together with the well-defined geometry of the Compton interaction, permits the reconstruction of the sky image over a wide field of view (~ 1 steradian) with a resolution of a few degrees. In addition, the instrument has the capability of searching for polarization of the radiation. The instrument has good capabilities for searching for weak discrete sources, weak diffuse galactic features, and for spectral and spatial features in the extragalactic diffuse radiation. (Principal Investigator: Dr. Volker Schönfelder, Max-Planck-Institut für Extraterrestrische Physik, Garching bei München, Germany, E-mail: <vos@mpe-garching.mpg.de>)

C. Energetic Gamma-Ray Experiment Telescope (EGRET)

The EGRET is designed to cover the energy range from 20 MeV to 30 GeV. The instrument uses a multiple layer spark chamber and thin metal conversion plates to detect gamma rays by the electron-positron pair-production process. A total energy counter using NaI(Tl) is placed beneath the instrument to provide good energy resolution over a wide dynamic range. The instrument is covered by a plastic scintillator anticoincidence dome to prevent readout of events not associated with gamma rays. (Principal Investigator: Dr. David L. Bertsch, NASA Goddard Space Flight Center, Greenbelt, MD, E-mail: <dlb@gamma.gsfc.nasa.gov>.

Note: There is now a limited amount of spark-chamber gas remaining, and some sub-components of the EGRET instrument have failed. The use of EGRET in Cycle 9 and beyond will be for significant targets of opportunity. About 6 weeks of ToO observing time will be allocated for Cycle 9. The actual amount of time for which EGRET will be turned on will be determined by the project based on performance monitoring of the instrument during Cycles 8 and 9. In any case, any future use of EGRET will be determined on a competitive basis resulting from the evaluation of proposals received in response to this and future *Compton* GRO Guest Investigator Program announcements.

D. Burst and Transient Source Experiment (BATSE)

The Burst and Transient Source Experiment for *Compton* GRO is designed to continuously monitor a large fraction of the sky for a wide range of transient gamma-ray events. The experiment consists of eight wide-field detector modules at the eight corners of the spacecraft platform. This arrangement provides maximum continuous exposure to the unobstructed sky. The instrument has 0.1 ms time resolution, strong burst location accuracy of about three degrees, and sensitivity of $\sim 3 \times 10^{-8}$ erg/cm^2 for a 1 sec burst. Pulsed sources as weak as ~0.03 x Crab pulsar can be detected using onboard or on-ground folding (10^5 sec exposure). Using the Earth occultation technique, BATSE can monitor sources as weak as ~0.1 x Crab with one-day resolution. (Principal Investigator: Dr. Gerald J. Fishman, NASA Marshall Space Flight Center, Huntsville, AL, E-mail: <fishman@ssl.msfc.nasa.gov>)

	OSSE	COMPTEL	EGRET	BATSE	BATSE
				LARGE AREA	SPECTROSCOPY
ENERGY RANGE (MeV)	0.06 to 10.0	0.8 to 30.0	20 to 3 x 10^4	0.03 to 1.9	0.015 to 110
ENERGY RESOLUTION (FWHM)	12.5% at 0.2 MeV 6.8% at 1.0 MeV 4.0% at 5.0 MeV	8.8% at 1.27 MeV 6.5% at 2.75 MeV 6.3% at 4.43 MeV	~20% 100 to 2000 MeV	32% at 0.06 MeV 27% at 0.09 MeV 20% at 0.66 MeV	8.2% at 0.09 MeV 7.2% at 0.66 MeV 5.8% at 1.17 MeV
EFFECTIVE AREA (cm^2)	2013 at 0.2 MeV 1480 at 1.0 MeV 569 at 5.0 MeV	25.8 at 1.27 MeV 29.3 at 2.75 MeV 29.4 at 4.43 MeV	1200 at 100 MeV 1600 at 500 MeV 1400 at 3000 MeV	1000 ea. at 0.03 MeV 1800 ea. at 0.1 MeV 550 ea. at 0.66 MeV	100 ea. at 0.3 MeV 127 ea. at 0.2 MeV 52 ea. at 3 MeV
POSITION LOCALIZATION (STRONG SOURCE)	10 arc min square error box (special mode; 0.1 x Crab spectrum)	0.5 - 1.0 deg (90% confidence 0.2 x Crab spectrum)	5 to 10 arc min (1s radius; 0.2 x Crab spectrum)	3° (strong burst)	———
FIELD OF VIEW	3.8° x 11.4°	~ 64°	~ 0.6 sr	4 sr	4 sr
MAXIMUM EFFECTIVE GEOMETRIC FACTOR (cm^2 sr)	13	30	1050 (~ 500 MeV)	15000	5000
ESTIMATED SOURCE LINE SENSITIVITY (5 x10^5 sec; on source, off Galactic Plane) CONTINUUM	(3-8) x 10^{-5} cm^{-2} s^{-1} 3 x 10^{-7} cm^{-2} s^{-1} keV^{-1} (@1 MeV)	1.5 x 10^{-5} to 6 x 10^{-5} cm^{-2} s^{-1} 1.6 x 10^{-4} cm^{-2} s^{-1} (3 s detection, 1-30 MeV)	7 x 10^{-8} cm^{-2} s^{-1} (> 100 MeV) 2 x 10^{-8} cm^{-2} s^{-1} (> 1000 MeV)	3 x 10^{-8} erg cm^{-2} (1 sec burst)	0.4% equivalent width (5 sec integration)

Table 1 Summary of *Compton* GRO Detector Characteristics

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS FOR SOLICTED BASIC RESEARCH PROPOSALS

NASA Federal Acquisition Regulations (FAR) Supplement (NFS) Version 89.90
Part 1852.235-72 (January 1997)
(accessible through URL <http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>,
open "Part 1852.228 to 1852.241" from the menu).

(a). General.

(1) Proposals received in response to a NASA Research Announcement (NRA) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

(2) A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

(3) NRA's contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRA's.

(4) A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument. Contracts resulting from NRA's are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement (NFS). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

(5) NASA does not have mandatory forms or formats for responses to NRA's; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

(6) To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

(b). NRA-Specific Items. Several proposal submission items appear in the NRA itself: the unique NRA identifier, when to submit proposals, where to send proposals, number of copies required, and sources for more information. Items included in these instructions may be supplemented by the NRA.

(c). Proposal Content. The following information is needed to permit consideration in an objective manner. NRA's will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

(1) *Transmittal Letter or Prefatory Material.*

(i) The legal name and address of the organization and specific division or campus identification, if part of a larger organization;

(ii) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;

(iii) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;

(iv) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;

(v) Identification of other organizations that are currently evaluating a proposal for the same efforts;

(vi) Identification of the NRA, by number and title, to which the proposal is responding;

(vii) Dollar amount requested, desired starting date, and duration of project;

(viii) Date of submission; and

(ix) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization(unless the signature appears on the proposal itself).

(2) *Restriction on Use and Disclosure of Proposal Information.* Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following Notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the Notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the Notice.

Notice

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract(or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract(or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

(3) *Abstract*. Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

(4) *Project Description*.

(i) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance, relation to the present state of knowledge, and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(ii) When it is expected that the effort will require more than one year, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

(5) *Management Approach*. For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described.

(6) *Personnel*. The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications, and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

(7) *Facilities and Equipment*.

(i) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use. Include evidence of its availability and the cognizant Government points of contact.

(ii) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non research purposes should be explained.

(8) *Proposed Costs*.

(i) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages, fringe benefits, equipment, expendable materials and supplies, services, domestic and foreign travel, ADP expenses, publication or page charges, consultants, subcontracts, other miscellaneous identifiable direct costs, and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel). Estimate all staffing data in terms of staff-months or fractions of full-time.

(ii) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired, purpose and estimated number and lengths of trips planned, basis for indirect cost computation(including date of most recent negotiation and cognizant agency), and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases.

(iii) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831(and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

(9) *Security*. Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

(10) *Current Support*. For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

(11) *Special Matters*.

(i) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(ii) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

(d). Renewal Proposals

(1) Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

(2) NASA may renew an effort either through amendment of an existing contract or by a new award.

(e). Length. Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments.

(f). Joint Proposals.

(1) Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

(2) Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

(g). Late Proposals. A proposal or modification received after the date or dates specified in an NRA may be considered if doing so is in the best interests of the Government.

(h). Withdrawal. Proposals may be withdrawn by the proposer at any time before award. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

(i). Evaluation Factors

(1) Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

(2) Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

(3) Evaluation of its intrinsic merit includes the consideration of the following factors of equal importance:

(i) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(ii) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(iii) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(iv) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

(4) Evaluation of the cost of a proposed effort may include the realism and reasonableness of the proposed cost and available funds.

(j). Evaluation Techniques. Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases, proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

(k). Selection for Award.

(1) When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

(2) When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

(l). Cancellation of NRA. NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for anyone's failure to receive actual notice of cancellation.

THE *COMPTON* GAMMA RAY OBSERVATORY GUEST INVESTIGATOR PROGRAM

I. Program Objective

The objective of the *Compton* Gamma Ray Observatory Guest Investigator Program is to maximize the scientific return from the *Compton* GRO mission by broadening the scientific participation in the analysis of data, expanding the scope of observations, and conducting correlative research that is closely tied to the *Compton* GRO observations.

II. Program Scope

Compton GRO is comprised of four distinctly different instruments which are optimized to perform simultaneous observations of specific targets or regions. NASA, with advice from the *Compton* GRO Users Committee, has accordingly defined various types of proposals and modes of participation in this Program. These allow proposers to structure their investigations to make the best use of the available resources, taking into account their own familiarity with the instruments and analysis techniques. The *Compton* GRO Guest Investigator (GI) program is generally structured in terms of four operational phases of the mission and four types of proposals that may be submitted by Guest Investigators. These structural elements are defined in the following sections.

This NRA applies only to Cycle 9 of the mission. This specific guidance for responding to this NRA is given in Appendix D. Subsequent NRA's are planned to be issued at intervals of approximately 12-18 months.

A. Data Types

Two broad categories of data will be generated at the Instrument Team institutions:

1. <u>Low-level processed data</u>:
   These data are products of "automatic" pipeline processing. They will generally be produced within a few months of acquisition. Examples of low-level data include: a) Burst and Transient Source Experiment (BATSE) gain-corrected pulse-height spectra and rates from normal telemetry stream (i.e., not burst memory readouts), rates and uncorrected spectra from burst memory, relative rates for determining approximate burst locations; b) Imaging Compton Telescope (COMPTEL) gain-corrected pulse height, pulse shape, position, and time-of-flight of individual events, raw spectra from burst detectors, shield rates; c) Energetic Gamma-Ray Experiment Telescope (EGRET)

directions and energies of gamma-ray events, gain corrected pulse-height spectra for bursts and flares, anticoincidence shield rates; d) Oriented Scintillation Spectrometer Experiment (OSSE) gain corrected 2-minute spectra, event-by-event pulsar data, count rates from shields for burst and flare studies.

2. High-level processed data:
   These data are products of detailed processing, including instrumental calibrations and background corrections, which are expected to be produced several months after acquisition. Examples of these data include: a) BATSE time-resolved background-subtracted count and photon spectra of bursts and transients, high temporal resolution rate histories of bursts, good quality source locations; b) COMPTEL sky maps accumulated during two week observations, background-corrected photon spectra of selected objects in the field of view; c) EGRET sky maps accumulated during 2-week observations, photon spectra of selected sources in the field of view; d) OSSE background-subtracted count and photon spectra accumulated in intervals from several minutes up to 2 weeks.

   Detailed descriptions of the different data sets and their projected availability is provided in Appendix G (available electronically or in hardcopy upon request).

B. Mission Phases

Four operational phases have been defined for the *Compton* GRO mission. Following deployment there was an initial period of approximately 40 days devoted to checking out the spacecraft and instruments, followed by the Phase 1, 2, and 3 observing periods. This NRA solicits proposals for Guest Investigations for a 1.5-year period of Phase 4, to be called Cycle 9. Opportunities during this cycle are described in more detail in Appendix D.

Phase 1: A period beginning May 16, 1991, ending on November 17, 1992. Observing time during this first phase was allocated exclusively to the Instrument Teams. Key activities during this phase included verification of the scientific performance of the instruments, performance of a comprehensive sky survey (EGRET and COMPTEL), and the conduct of observations of high-priority discrete and diffuse sources (OSSE, EGRET, and COMPTEL). During this period, the Instrument Teams developed and refined the initial data processing software and procedures. Opportunities available to Guest Investigators were primarily in the form of cooperative, correlative, and theoretical research projects in conjunction with the predefined observations of the Instrument Teams.

Phase 2: A 9-month period immediately following Phase 1, which ended on September 7, 1993. During this phase, 30% of the total observing time was allocated to Guest Investigators. In addition, a portion of the solar flare and gamma-ray burst data from the four instruments was made available for guest investigations.

Phase 3: A 12-month period immediately following Phase 2. In Phase 3, approximately 55 percent of the observing time was allocated to Guest Investigators. In addition, 60 percent of the Instrument Team data on randomly selected solar flares and cosmic gamma-ray bursts was made available.

Phase 4: The remainder of the mission. Observing time allocations between Guest Investigators and Instrument Teams for this period are not predetermined, but are decided completely on the basis of peer review.

Proposers should note that the information provided above may be modified by NASA as the *Compton* GRO mission progresses and is provided here to acquaint users with the plans for future cycles of the mission.

C. Types of Proposals

Four types of proposals have been identified as being applicable to the *Compton* GRO Guest Investigator Program during Cycle 9. Funding priorities will be weighted so as to favor Types 1 and 2 over Types 3 and 4, although each proposal type will be considered for support. An important exception to this general rule will be correlative research programs that will attempt to identify gamma-ray burst counterparts at non-gamma-ray wavelengths via prompt observing campaigns utilizing BACODINE or related techniques. These proposals will receive comparable weighting to Type 1 and 2.

Type 1: Proposals for analysis or use of existing (archival) *Compton* GRO data.

Type 2: Proposals for observing time during Cycle 9, including Targets of Opportunity proposals, or for other analyses of proprietary *Compton* GRO data, such as BATSE data.

Type 3: Proposals for correlative research that are closely tied to *Compton* GRO observations. Correlative research involves data obtained by a Guest Investigator from observations in the same or other wavelength regions and/or from other spacecraft, rockets, or balloons that would be used in combination with *Compton* GRO observations of selected objects or phenomena[3].

Type 4: Proposals to perform services to the community in direct support of *Compton* GRO related scientific research activities. Examples include the establishment of online databases or catalogs and the development of analysis software or data products complimentary or superior in some manner to that provided by the *Compton* GRO Science Support Center or the Instrument Teams.

[3] Funds for correlative research will be used to cover operational expenses, data analysis, and expenses involved directly in collaborating with *Compton* GRO Investigators. Funds under this category will not generally be authorized for: the conduct of observations in other wavelength bands; the conduct of observations from other spacecraft, observatories, rockets, or balloons; procurement of observatory facilities; or development of flight hardware. The Agency may under certain circumstances consider exceptions to this policy.

D. Use of archival *Compton* GRO data

Once *Compton* GRO data products reside in the pubic domain at *Compton* GRO Science Support Center, or some other archival research center, they are accessible to all users (see section III. D below). In this case, a response to this NRA is not necessary, provided that research funds are not to be requested.

III. Additional information

A. Data Policies

1. Proprietary Data Rights

Data resulting from observations specifically approved as part of a peer reviewed proposal by any Investigator are considered proprietary for a period up to 3 months after receipt of the data by the investigator in a usable form.

Data resulting from any peer-review approved Target of Opportunity (ToO) program (see Appendix D, section I.C) will be the exclusive property of the proposer for a 3 month proprietary period. If an unproposed ToO candidate appears, and a decision is made to observe it, the data will be made available immediately after processing through the public archive at the *Compton* GRO Science Support Center.

Information, including burst and other alerts, derived from nonproprietary *Compton* GRO data and relayed via various NASA and public networks, is considered published without constraints or pre-conditions on its use.

With the exceptions enumerated below, all data that have not been specifically proposed and awarded on the basis of competitive peer review is public domain data. NASA will make every effort to ensure that these data are placed in accessible data bases permitting equal access to all interested scientists.

In order to provide the astronomical community with timely access to complete, uniformly analyzed data sets, the Instrument Teams have the responsibility to produce catalogs of all detected sources and maps of all detected diffuse emission. These catalogs and maps will eventually incorporate all *Compton* GRO observations. Observations conducted by Guest Investigators will not be included in the Instrument Teams' catalogs and maps prior to the expiration of the 3-month proprietary period without the consent of the Guest Investigator.

In addition to these general proprietary data, certain scientific research projects or sources have been identified as reserved for the Instrument Teams in recognition of their relationship to the originally proposed investigations and the special technical requirements of the analysis. These topics or sources are listed below for each of the *Compton* GRO instruments:

The Oriented Scintillation Spectrometer Experiment (OSSE):

The OSSE Team has been assigned the sole responsibility to carry out the following scientific investigations:

- Observations up to 2 years after their discovery of new Galactic or local group supernovae
- Performance of a comprehensive Galactic plane survey (not including proposed discrete source observations)

Guest Investigators will have the opportunity to participate in the OSSE scientific teams to investigate these topics.

The Imaging Compton Telescope (COMPTEL):

The COMPTEL Team has been assigned the sole responsibility to carry out the following scientific investigations:

- Preparation of an all-sky map of diffuse emission
- Preparation of a complete catalog of discrete sources
- Observations up to 2 years after their discovery of new Galactic or local group supernovae

The Energetic Gamma Ray Experiment Telescope (EGRET):

The EGRET Team has been assigned the sole responsibility to carry out the following investigations:

- Preparation of an all-sky map of diffuse emission
- Preparation of a complete catalog of discrete sources

The Burst and Transient Source Experiment (BATSE):

The BATSE Team has been assigned the sole responsibility to carry out the following investigations:

- Preparation of a comprehensive catalog of cosmic gamma-ray bursts[4]

Notwithstanding the above restrictions, all *Compton* GRO data will become accessible to the scientific community 3 months after production of these data in usable form.

[4] Note that this does not preclude the possibility to propose for data rights to individual bursts.

Other Items:

1. BATSE Monitoring Reports

   Certain information derived from BATSE quick-look Earth-occultation and pulsar data analysis will be placed promptly in the public domain (via the Internet at MSFC and accessible through the *Compton* GRO Science Support Center at <http://cossc.gsfc.nasa.gov>). These data are intended primarily for planning purposes and are not recommended for use in detailed analysis leading to publication.

2. Multiyear Programs

   Multi-year projects can no longer be supported and they should not be proposed. A number of multiyear programs of indefinite or 4-5 year duration were approved during Cycles 4 and 5. These programs will no longer be automatically carried over — they must be reproposed for Cycle 9 and annually thereafter.

3. Parallel Data and Serendipitous Sources

   Two special attributes of the *Compton* GRO mission are the capability for simultaneous observations by the four instruments and the relatively wide fields of view of two of the pointed instruments (EGRET and COMPTEL). In many cases, this will permit two or three proposed and accepted scientific investigations to be accomplished concurrently. For times during which approved observations are underway involving one or two instruments, while unproposed data is being accumulated in parallel, the following rule will apply:

   If a serendipitous source is detected during routine pipeline data processing by the EGRET, COMPTEL, or OSSE Instrument Teams, the data will be placed promptly into the public domain. The Instrument Teams will use their normal criteria for source detection in this situation. Serendipitous sources found in the field of view of an approved target which are not detected during routine processing by the Instrument Teams may be claimed by the discoverer. Proprietary rights to that data for a 3-month period can then be established for the first claimant by contacting the *Compton* GRO Science Support Center.

4. Solar Flare and Gamma Ray Burst Data

   The selection of solar flare and burst data available to Guest Investigators from OSSE, COMPTEL, and EGRET will, in general, be derived from events identified by BATSE. If an investigation so requires, data from a particular event will be made available from all instruments for analysis whenever possible.

5. Calibration Data and Observations

An allotment of observing time equivalent to one 2-week viewing period may be granted at the discretion of the project scientist for instrument calibration purposes. The specific plans for the use of this discretionary time will not be subjected to peer-review, but must be reviewed and approved by the project scientist. The expected mode of implementation would be through coordinated dialog between the 4 Instrument Teams, the Project Scientist, and the *Compton* GRO Timeline Committee. These activities will not be funded through the Guest Investigator Program.

Additional or alternative calibration studies must, as in the past, be awarded through peer review, although it is our expectation that the needed calibration observations can be carried out within the allotted discretionary time allocation. Calibration studies selected through peer review are eligible for grant support.

6. New Data Which Were Not Proposed For and Awarded through Peer Review

Other data which may have been obtained during Cycle 9, but which were not specifically proposed for and awarded through peer review, will in general be made available upon request prior to the expiration of the normal proprietary period. Examples of such data might include off-axis COMPTEL or EGRET sources or OSSE secondary targets inserted into the viewing plan by the time-line committee to fill a void in the schedule. For BATSE, which has an uncollimated, full-sky view, all triggered gamma-ray bursts and solar flare events will be made promptly available to any interested party. Additionally, BATSE Earth-occultation or pulsar data products, for sources not already awarded through peer review, will be made available as well.

All requests for data satisfying the above criteria should be directed to the *Compton* GRO Science Support Center <shrader@grossc.gsfc.nasa.gov>. Questionable cases, such as point sources which may be only marginally resolvable from approved point-source fields or requests requiring excessive data processing efforts, will be mediated on a case-by-case by the *Compton* GRO Project Scientist.

B. Restrictions on Service Proposals

There are certain restrictions on what types of activities are eligible for support under the Type 4 Service Proposal category; specifically, tasks which have already been contracted through longstanding agreements to the Instrument Teams and the *Compton* GRO Science Support Center will not be supported. The Instrument Teams have contractual responsibilities to:

- Monitor instrument specific flight hardware and maintain flight software.
- Communicate with and advise flight operations team (FOT) on instrument specific issues.
- Perform basic processing of incoming data including manual inspection/screening as needed.
- Monitor instrument performance and maintain revise calibration parameters when warranted as the instruments age.
- Generate basic data products as outlined in Appendix H (e.g. photon event lists, exposure and counts maps, count spectra, response matrices) and deliver to the *Compton* GRO Science Support Center and/or guest investigators.

Anyone considering submitting a service proposal who is uncertain about these restrictions is encouraged to contact the *Compton* GRO Science Support Center for clarification.

C. Proposal Evaluation and Selection

The proposal review process will be directed by the *Compton* GRO Program Scientist at the Office of Space Science, NASA Headquarters. Proposals for investigations under the *Compton* GRO Guest Investigator program will be evaluated by a NASA-convened peer review panel derived from the international scientific community.

Proposals approved for pointed observations (Type 2 proposals for OSSE, EGRET, and COMPTEL) will be submitted to the *Compton* GRO Timeline Committee for scheduling following the peer review process. Targets will be scheduled taking into account the A, B, or C priority rankings assigned by the peer review. The Timeline Committee will include representation from the user community. Once an observation is scheduled, the proposer will be informed that his or her proposal has been accepted.

D. Policy on Oversubscribed Proposals

Some over selection of proposed pointed observations relative to the nominal time available will be made to allow for an optimal viewing plan to be constructed. An attempt will be made to carry over into the next cycle any scheduled priority A targets that are dropped from the timeline due to operational considerations or targets of opportunity. In such cases, consideration will be given to the net time loss incurred by the program and the assessed impact of the time loss to the scientific objectives of the proposed research. Targets which are unable to be scheduled, even if they are priority A, will not automatically carry over into the next cycle. Only proposals that are accommodated in the timeline will be considered for funding.

GUIDELINES FOR *COMPTON* GAMMA RAY OBSERVATORY GUEST INVESTIGATOR PROPOSALS DURING CYCLE 9

The information contained in Appendix D augments and supersedes Appendix B and is applicable only to this NRA.

Cycle 9 of the *Compton* GRO Mission is planned to begin in December 1999 and will last approximately 18 months. Data products from previous CGRO observation cycles will also be available for analysis during Cycle 9. See the *Compton* GRO home page at <http://cossc.gsfc.nasa.gov> for details. Proposals utilizing existing data and correlative studies closely related to the *Compton* GRO mission will also be given consideration.

General information relating to the *Compton* GRO Guest Investigator Program, data products, types of proposals, mission phases, and modes of participation can be found in Appendix C. Proposal Types 1-4 are solicited during Cycle 9. Appendix G, provides detailed information about the instruments, their scientific objectives, sensitivities, and data products.

I. Opportunities For Guest Investigations

A. Analysis or Use of Archival Data (Proposal Type 1)

Data products from previous cycles will be available for use during Cycle 9. The specific products and their availability are described in detail in Appendices G and H.

Previous observations are summarized in the viewing plans or “timelines” for each previous cycle. Previous viewing plans, abstracts of previously approved programs, as well as additional information on sky exposure for EGRET and COMPTEL, are available on the Internet through the *Compton* GRO home page at <http://cossc.gsfc.nasa.gov>.

Observing timelines are most significantly constrained by spacecraft thermal and power considerations (location of the Sun) and by the requirement that likely discrete sources of gamma radiation be observable by the OSSE experiment. The OSSE detectors can rotate over a full range of 192^o about the Y-axis, providing the capability to observe sources in the X-Z plane. For each Z-axis pointing of the spacecraft, an X-axis orientation is chosen to provide, ideally, two targets for OSSE to observe (refer to Figure 1 for definition of axes). The BATSE instruments provide continuous sensitivity to the entire unocculted sky and do not affect the viewing program.

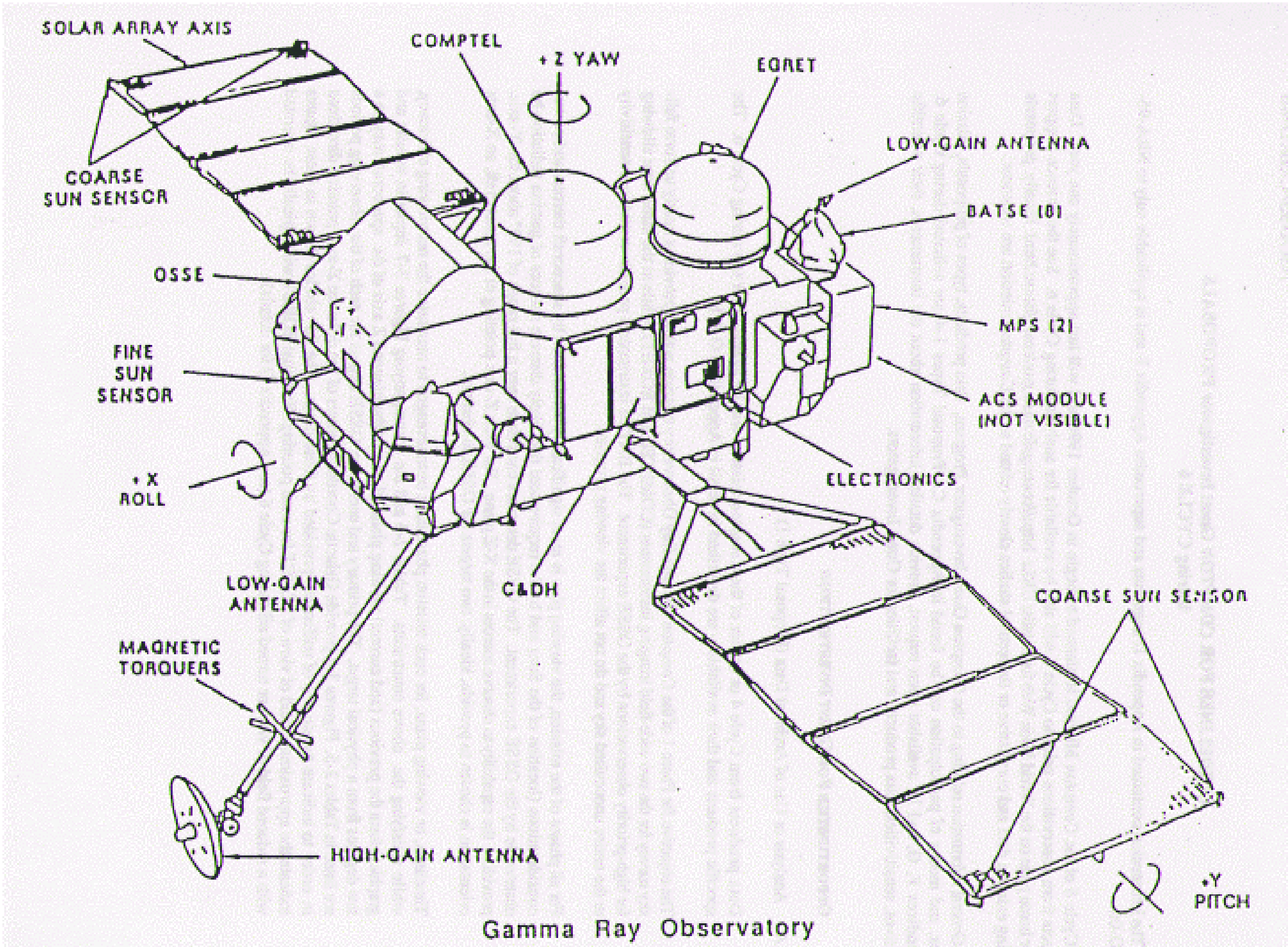

Figure 1: Schematic Diagram of the *Compton* Gamma Ray Observatory

B. Observing Time Proposals (Proposal Type 2)

Observing time will be allocated with no predetermined ratio between Guest Investigators and Instrument Team members. There are no targets reserved for the Instrument Teams, other than those uniquely related to the objectives described in section III.A.1 of Appendix C.

1. EGRET, COMPTEL, AND OSSE

Excepting the specific topics for which these Instrument Teams have sole responsibility, as listed above in Appendix C, section III.A.1, Guest Investigators may propose observations without restrictions. Target conflicts will be taken into consideration in the selection process.

2. BATSE

In addition to the gamma-ray burst and solar flare data discussed earlier, investigators may propose to analyze the data continuously obtained by the BATSE instrument. This includes temporal observations of hard x-ray sources performed using the Earth occultation technique, as well as observations of pulsating sources.

Excepting the any assigned solely to the BATSE Instrument Team, as described in Appendix C, Guest Investigators may propose BATSE observations without restrictions. Investigators wishing to work on the determination of burst positions by arrival time difference methods may contact the BATSE Team for a possible collaboration.

The specific observing modes and data products are detailed in Appendix G.

C. Targets of Opportunity (ToO) (Proposal Type 2)

One of the important objectives of *Compton* GRO is the observation of transient phenomena such as supernovae, novae, solar flares, or AGN variability. In order to make such observations, it may be necessary to interrupt the viewing program and reorient the satellite. Because such reorientations place significant demands on project resources, at most four or five such observations will be allowed during Cycle 9. Investigators may propose to observe Targets of Opportunity (ToOs), either for individual objects or for classes of objects. If a candidate ToO occurs, the Project Scientist will determine whether or not a formal ToO declaration is made. **Proposers should be as specific as possible in defining the trigger criteria for ToO activation**. The peer review committees will be asked to carefully review these criteria and recommend changes as deemed warranted.

Data resulting from any peer-review approved ToO program will be the exclusive property of the proposer for the normal 3-month proprietary period. If an unproposed ToO candidate appears, and a decision is made to observe it, the data will be made available immediately after processing through the public archive at the *Compton* GRO Science Support Center.

ToO programs will generally not be funded until a ToO satisfying the proposer's trigger criteria occurs and a formal ToO declaration is made by the Project Scientist.

D. Other Guest Investigator Opportunities (Proposal Types 3 and 4)

Correlative research (Type 3) proposals are welcome during Cycle 9, although they will generally be given a lower funding priority than observing (Type 2) or data analysis (Type 1) proposals. An exception to this policy will be made in the case of correlative observation programs utilizing the BACODINE system, or related methods, to search for counterparts to gamma-ray bursts discovered by *Compton* GRO at nongamma-ray wavelengths.

Service proposals (Type 4) are solicited during Cycle 9, although they will be given a lower funding profile than observing (Type 2) or data analysis (Type 1) proposals. Note the restrictions in Section III.B of Appendix C on what types of activities are eligible for support within service proposals under the *Compton* GRO Guest Investigator Program.

E. Additional Information

1. Proposals requesting access to more than one *Compton* GRO instrument, either for observing time or for analysis of existing data, may be submitted under one cover.

2. Multiyear proposals, which under certain conditions had been accommodated during previous cycles, will not be considered for Cycle 9 and beyond.

General information concerning *Compton* GRO Guest Investigator opportunities during Cycle 9 can be obtained from: Dr. Chris R. Shrader, *Compton* GRO Science Support Center, Code 661, NASA Goddard Space Flight Center, Greenbelt, Md. 20771-0001. (E-mail: <shrader@grossc.gsfc.nasa.gov> or Telephone: (301) 286-8434). Also see <http://cossc.gsfc.nasa.gov> on the Internet.

II. Proposal Preparation and Submission Information

This NASA Research Announcement soliciting participation in Cycle 9 of the *Compton* GRO Guest Investigator Program is fully open to the international scientific community. The following guidelines should be followed in the preparation of proposals for participation in this program.

A. Requests for Appendices

Proposers interested in receiving Appendix G (The *Compton* GRO as a Guest Investigator Facility) and Appendix H (*Compton* GRO Project Data Management Plan, July 1990) should submit a request as soon as convenient. There are also a limited number of copies of Appendix F (The *Compton* Gamma Ray Observatory Science Plan, September 1989, prepared by the *Compton* GRO Science Working Team). Requests should be made to the following address:

Ms. Sandy Barnes
Compton GRO Cycle 9 NRA
Compton Gamma-Ray Observatory Science Support Center
Code 661
Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, MD 20771-0001
USA
E-mail: <barnes@grossc.gsfc.nasa.gov>

Alternatively, Appendices G and H can be accessed electronically on the *Compton* GRO Science Support Center homepage at <http://cossc.gsfc.nasa.gov> or on the NASA Office of Space Science homepage at <http://www.hq.nasa.gov/office/oss/> by selecting "Research Opportunities."

B. Proposal Format, Content, Quantity, and Certification

1. Overview

The proposal review procedure will be conducted in two stages to minimize the burden of proposal preparation. During the first part, the scientific and technical merits of the proposed investigation will be reviewed, including the appropriateness of using *Compton* GRO to address the scientific objectives and its relevance to furthering the understanding of high energy astrophysical processes. Based upon the criteria defined in Appendix D section III of this NRA, a panel of scientific peers will evaluate all submitted proposals as the Stage 1 review (Scientific and Technical Review). Additional details, including an approximate funding-level guideline, will be provided with the Stage 2 solicitation. A subset of the scientific peer review committee and project officials will review these Stage 2 proposals. The HQ Program Scientist will then make specific funding recommendations to the Selecting Official for these proposals. As was the case in all previous cycles, investigators working outside the U.S. are not eligible for NASA funding support.

2. Stage 1 Proposal Content

The Stage 1 Proposal must include a set of standard cover forms as described below. The information in the forms will be entered into a data base that will be used in cataloging and evaluating proposals. Note that for approved proposals, NASA plans to enter information from the cover page into an electronically accessible database to be made available to proposers to this and other related Space Science Programs. Proposal titles, names of Principal Investigators and their institutions, and abstracts of all selected proposals will be published in an publicly accessible database. Therefore, the submitted abstract should not contain any proprietary information that would preclude its release without restriction.

a) Proposal Forms: Electronic, as well as hard copy, submission of each of the forms described below is required. The form submission software will automatically provide a printable (LaTeX) hard copy. For instructions, send a blank E-mail message to <rps@legacy.gsfc.nasa.gov>.

Each proposal must have a standard cover page, a proposal Cover Form, and a General Information Form. For proposals requesting observing time, an Observation Definition Form(s), and optionally, Observation Constraints and Special Requirements Forms, specifying each target or target grouping, must be included. Paper copies of these forms are enclosed in Appendix E.

The Cover Form should include an Abstract summarizing the proposed research in a concise manner. The abstract should be limited to 1000 characters, including spaces between words. If the abstract exceeds this length, it will be truncated automatically.

NASA requests that each proposer who anticipates requesting funding provide an approximate estimate of the total cost to NASA of his/her proposed investigation. This information will be used in gauging the approximate total cost to NASA of the ensemble of proposals. A more detailed cost evaluation will be deferred until the Stage 2 review. The requested amount in the final cost proposal included in the Stage 2 submission should not exceed this estimate. Please use the box provided on the General Information Form to enter this figure. As with other proposal form information, electronic and hard copy submission are both required.

Note that although a signature block is included on the general form, institutional endorsements are optional with the initial proposal submission. The cost estimate is considered to be a guideline to the project, rather than a final budget request, as such, institutional endorsement is not required at this stage. Institutional endorsements will be required later with Stage 2 submissions. A signature block is provided in case signatures are required by the proposer's institution at the initial submission stage.

b). Technical Section: The scientific and technical section of the proposal (including text, tables, references, and figures, but not including the mandatory forms) is limited to four pages (i.e., two double-sided sheets). The text should be contained in the first three pages, with the fourth page reserved for figures and/or tables. There are no exceptions to this policy. In all cases, type should not be smaller than 10 point, there should be no more than 55, single spaced lines per 8_"_11" page, and margins should be a minimum of 1" on all sides.

Proposers are requested to summarize within these pages the scientific justification, the feasibility of the observations, and plans for data analysis. Two-sided copy should be used for the main body of the proposal.

c). Summary of Previous *Compton* GRO work: Curriculum Vitae should not be included, nor should any appendices or other attachments such as reprints of journal articles.

The PI for each proposed Cycle 9 Investigation should include a list of previous approved *Compton* GRO Guest Investigations for which he/she was the PI. This should simply state the proposal title and the mission phase/cycle.

In addition to this list of previous investigations, the PI of the proposed investigation should compile a chronologically sorted list of publications *resulting from these previous programs* for which he/she is primary- or co-author. This should include the paper titles, but otherwise be in standard journal format. Truncate or edit as necessary to comply with the overall 2- page limit for this section.

The entire listing of previous programs, publication list **should not exceed 2 pages** (one double-sided sheet). Truncate publication lists (e.g. retaining the most recent references), as necessary.

3. Stage 2 Proposal

A cost proposal will be requested for all successful proposed investigations that pass the Stage 1 review and that require financial support from NASA. As part of the proposal and corresponding budget for a *Compton* GRO investigation, proposers may request support for correlative observations at other wavelengths. Funding for such correlative studies will be considered only insofar as they directly support a specific investigation using *Compton* GRO. Furthermore, funding priorities will favor *Compton* GRO observations and data analysis proposals as detailed in Appendix C. The cost proposal may be prepared according to the guidelines of the institution submitting the proposal, but it must contain:

- A complete list of all awarded or pending research funding support from NASA or other sources for the Principal Investigator and Co-investigators. The information needed includes: Agency, Grant/Contract Number, Title, Amount, Starting and Ending Dates, and Level of Effort (percent).
- A detailed breakdown of the responsibilities of the various investigators taking part in the proposed study.
- Cost estimates for direct labor, including individual person-months and rates for the personnel involved.
- Estimated costs for equipment, materials, and computer services, including type of computer and number of hours of mainframe computer use. Itemize items over $500.
- Travel costs – itemize trips, including travel to data analysis centers. In general, only one trip per team member to a professional society meeting will be supported.
- Overhead rates and cost.
- Other costs, with explanation, including any E/PO proposal costs.
- Contributions from any cost-sharing plan.
- Total cost of support being requested from NASA.

Funding under this Program is available only to Principal Investigators and Co-Investigators affiliated with U.S. institutions.

C. Submission of Proposals:

Fifteen copies, including the original, of all proposals should be sent to:

Compton GRO Guest Investigator Program
NRA 99-OSS-02
Code 661
Building 2, Room 246
Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, MD 20771-0001
USA
Telephone: (301) 286-8434
E-mail: <shrader@grossc.gsfc.nasa.gov>

Electronic submission of all proposal forms (including the cover page, general form, and observation definition form) is a requirement for Cycle 9. For details, send a blank E-mail message to:

<rps@legacy.gsfc.nasa.gov>

Additional information can be obtained from the World Wide Web at:

<http://cossc.gsfc.nasa.gov>

Proposals should be mailed so as to arrive at the above address before the proposal due date. NASA reserves the right to consider proposals received after this date if judged to be in the best interest of the Government.

D. Guidelines for Foreign Participation:

NASA welcomes proposals from outside the U.S. However, investigators working outside the U.S. are not eligible for funding from NASA. Proposals from non-U.S. entities should not include a cost plan. Proposals from outside the U.S. and U.S. proposals that include non-U.S. participation must be endorsed by the respective government agency or funding/sponsoring institution in that country from which the non-U.S. participant is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

In addition to sending the requested number of copies of the proposal to the designated address, one copy of the proposal, along with the Letter of Endorsement from the sponsoring non-U.S. agency must be forwarded to:

Ms. W. C. Barnes
(NRA 99-OSS-02)
Space Science and Aeronautics Division
Code IS
NASA Headquarters
Washington, DC 20546-0001
USA

All proposals must be typewritten in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date; those received after the closing date will be treated in accordance with NASA's provisions for late proposals. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address if endorsement is not possible before the announced closing date. In such cases, however, NASA's Space Science and Aeronautics Division should be advised when a decision on endorsement can be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Research Program Management Division. Copies of these letters will be sent to the sponsoring government agency. Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's Space Science and Aeronautics Division will arrange with the non-U.S. sponsoring agency for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging their respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

1. A letter of notification by NASA, and
2. An exchange of letters between NASA and the sponsoring governmental agency; or
3. A formal Agency-to-Agency Memorandum of Understanding (MOU).

E. German Guest Investigator Program:

The German Space Agency (DARA Ltd.) supports a German Guest Investigator Program. The program guarantees that *Compton* GRO Guest Investigators get sufficient support and help at the Max-Planck-Institut für Extraterrestrische Physik for *Compton* GRO (COMPTEL and EGRET) data analysis. In addition, the program will provide limited travel and accommodation funds to those German scientists who want to visit or work closely with the Max-Planck-Institut (or with any of the *Compton* GRO research institutes in the US or the Netherlands). The German Guest Investigator Program is open to scientists from all countries. Proposers to the German program must also respond to this NASA Research Announcement. The proposals will be reviewed by the Peer Review Panel along with all other proposals.

Proposers to this NRA who wish to be considered for support under the German program must also submit an abbreviated proposal, as described below, to the German program at the address given below. The full proposal (conforming to the requirements specified in this NRA) will be evaluated together with all other proposals received in response to this NRA by a NASA-convened peer-review panel and NASA selecting official.

Dr. Werner Klinkmann
DARA GN-WE2
Koenigswinterer Strasse 522-524
P.O. Box 30 03 64
5300 Bonn 3
Germany

The cost section should also indicate how the proposer wants to finance expenses:
- research money from the scientific institute;
- funds from the Deutsche Forschungsgemeinschaft;
- funds from the DARA (only travel and accommodation money is available); or
- other sources.

Proposers from non-German institutes who are interested in working at the Max-Planck-Institut must obtain financial support from their respective countries (they need not submit proposals to the DARA or the Max Planck Institute). However, fellowships from the Max-Planck-Society will be available for a limited number of proposers (three to five per year). Those interested in working at the Max Planck Institute under this fellowship program should contact:

Dr. V. Schönfelder
Max-Planck-Institut für Extraterrestrische Physik
Forschungsgelände
8046 Garching bei München
Germany

III. Proposal Evaluation, Selection, and Implementation

A. Stage 1 Proposal

Proposals for investigations under the *Compton* GRO Guest Investigator program will be evaluated by a NASA-convened peer review panel made up from the international scientific community. The panel will include representation from European countries with substantial involvement in the *Compton* GRO mission.

The following criteria replace the criteria given in Appendix B. The criteria given in this paragraph apply only to the evaluation of proposals submitted in response to this NRA. The criteria in descending order of importance are:

- The overall scientific merit of the investigation.
- The relevance of the proposed research to NASA's Space Science program.
- The suitability of using the *Compton* Gamma Ray Observatory under the Cycle 9 guidelines for the proposed investigation, the feasibility of accomplishing the objectives of the investigation within the time and with the instrument(s) proposed, and the feasibility of the analysis approach with the data products that will be available, and the perceived scope of the project within the context of the overall *Compton* GRO project resources.
- The competence and relevant experience of the principal investigator and any collaborators as an indication of their ability to carry the investigation to a successful conclusion within the requested resources, including the timely publication of refereed scientific journal papers.
- In the case of proposers planning to work closely with Instrument Teams, the level of contribution to the Instrument Team and/or mission technical and scientific objectives.
- The reputation and interest of the investigator's institution to provide the necessary support to ensure that the investigation can be completed satisfactorily.

For those proposals requesting *Compton* GRO observing time, the peer review panel will assign one of three observational priorities to each proposed pointing for the COMPTEL, EGRET, or OSSE instruments. Priority A will be assigned to excellent, highest priority observations involving the best science and best usage of *Compton* GRO. Priority B will be assigned to important observations that should be accommodated if at all possible. Priority C will be assigned to observations which have a less compelling rationale and will be accommodated in the mission timeline as circumstances permit. Proposals, with target prioritizations, will be submitted to the *Compton* GRO Timeline Committee in order to formulate the overall observing timeline for Cycle 9.

B. <u>Stage 2 Proposal Evaluation and Selection</u>

A peer-review panel comprised of a subset of the Stage 1 review panel and *Compton* GRO project officials will consider Stage 2 requests. Evaluation based on overall cost and scientific value will lead to the recommendation of a set of proposals by the Program Scientist for this NRA to the Selecting Official for final selection and award. In addition to the overall scientific/technical rating of the proposed investigation from the Stage 1 Review, the primary evaluation criterion in the Stage 2 evaluation will review the cost details of the investigation, including the degree to which it is deemed reasonable in the context of the anticipated level of effort required to carry out the investigation, balanced by the level of available funds.

A recommendation for selection will be formulated by the Program Scientist for this NRA and then submitted to the selecting official, the Director, Research Program Management Division, Office of Space Science, following completion of the observing timeline. Selection will be based on the results of the Stage 1 evaluation, the results of the Stage 2 evaluation, and the results of the evaluation of any E/PO proposal. Proposals for observing time will be funded only after their accommodation in the *Compton* GRO timeline.

The Government's obligation to make awards is contingent upon the availability of appropriated funds from which payments can be made and the receipt of proposals that the Government determines are acceptable for award under this NRA. At the time of this writing, a total of approximately $0.5M is planned for the support of Guest Investigators working at U.S. Institutions during Cycle 9. Funds are also available for the analysis of existing data and for correlative studies relating to *Compton* GRO objectives.

Grants in conformance with NASA Grant and Cooperative Agreement Handbook (NPG 5800.1D) dated July 23, 1996, or contracts in conformance with acquisitions regulations will be generated in order to fund successful proposals.

C. Schedule:

The schedule for Cycle 9 of the *Compton* GRO Guest Investigator Program follows. Note that the dates of events planned beyond the Stage 1 Proposals due date are estimates and subject to change.

February 1, 1999	Release of NRA
May 6, 1999	Stage 1 Proposals due
July 1999	Stage 1 Peer Review; Tentative Selection of Proposals
July 1999	Timeline Committee Meeting
August 1999	Stage 2 Proposals Due
September 1999	Final Selection of Proposals
December 8, 1999	Begin Cycle 9 observations

FORMS AND CERTIFICATIONS

Cover Form
General Form
Observation Definition Form
Observation Constraints Form
Special Requirements Form

Certification Regarding Debarment, Suspension, and Other Responsibility Matters
Certification Regarding Lobbying

Proposal of *Compton* GRO Guest Investigation

GRO-99-000	**Cover Form**	**NRA-99-OSS-XX**

<table>
<tr><td colspan="4">PI Name

Title First name: Middle Initial Last name</td><td>Date</td></tr>
<tr><td colspan="5">
PI Institution</td></tr>
<tr><td colspan="5">Department</td></tr>
<tr><td colspan="5">Street Address</td></tr>
<tr><td>City</td><td>State</td><td>Country USA</td><td colspan="2">Postal Code</td></tr>
<tr><td colspan="5">Telephone</td></tr>
<tr><td colspan="5">E-mail address</td></tr>
<tr><td colspan="5">Proposal Title</td></tr>
<tr><td colspan="5">Proposal Type

__________ Type 1 Analysis of Archival Data __________ Type 3 Correlative Research

__________ Type 2 Request for Observing Time __________ Type 4 Service Proposals</td></tr>
<tr><td colspan="5">Subject Category</td></tr>
<tr><td colspan="5">Estimate of Total Project Cost $</td></tr>
<tr><td colspan="5">Abstract: 1000 characters maximum (about 150 words)</td></tr>
</table>

Proposal of *Compton* GRO Guest Investigation

GRO-99-000 **General Form** **NRA-99-OSS-XX**

PI Name Title First name: Middle Initial Last name				Date
Proposal Title				
Co-Investigators				
Last name:	First name:	Institution	Country	
PI Institution				
Administrative Authority (optional)				
Administrator (optional)				
Signature:			Date:	
Statement as to the desired affiliation with Instrument Team or special access to proprietary data.				

Proposal of *Compton* GRO Guest Investigation

GRO-99-000 **Observation Definition Form** **NRA-99-OSS-XX**

#	Target Name	RA	DEC	L	B	Instrument	Mode	Min. ex
								Wkn.
								Wkn
								Wkn
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								Wkn

All relevant target information must be contained on or attached to this form. List targets in order of priority. Note that exposure assumes optimal instrument response. Descriptions of the instrument modes can be found in Appendix G, NRA-99-OSS-XX. Use a separate line for each observing mode/exposure combination and for each instrument.

Proposal of *Compton* GRO Guest Investigation

GRO-99-000 **Observation Constraints Form** **NRA-99-OSS-XX**

#	Correlative	

Proposal of *Compton* GRO Guest Investigation

GRO-99-000	**Special Requirements Form**	**NRA-99-OSS-XX**

Special Requirements: Please indicated additional required scheduling constraints, special operational modes, or other special requests for any of the relevant targets from the above list. When including scheduling constraints for correlative or targeted observations, please include the widest possible window to facilitate scheduling. Stricter constraints will decrease the likelihood of a candidate target being scheduled.

NONE

Certification Regarding Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
  (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
  (d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Certification Regarding Lobbying

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.