



RESEARCH CORPORATION OF THE UNIVERSITY OF GUAM

INVITATION FOR BID RCUOG BID NO. 21-01

The Research Corporation of the University of Guam is soliciting sealed bids for:

High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT) Tomography Scanner and Support Services

Copies of Instructions and Information may be downloaded from the RCUOG website at www.uog.edu/rcuog under the subhead: Invitation for Bids. You may request a PDF copy of the bid packet via email to mconner@triton.uog.edu.

Deadline for Submission of Bid Packages is on Friday, November 22, 2021, at 2:00 P.M., via email to mconner@triton.uog.edu

Or mail to:

Research Corporation of the University of Guam
303 University Drive,
Mangilao, GU, 96913

OPENING OF BIDS

Bids will be opened at 2:00PM on November 24, 2021
College of Natural and Applied Sciences
Agriculture and Life Sciences Building, Room #125 A
University of Guam
Mangilao, Guam

DECISION TIMELINE

Submission Deadline – 2:00PM, November 22, 2021
Evaluation Committee Recommendation to RCUOG Executive Director - 5:00PM November 26, 2021
Notification of Award – No later than 5:00PM November 29, 2021

AUTHORIZED FOR ANNOUNCEMENT


Thomas Krise (Nov 1, 2021 13:18 GMT+10)

Dr. Thomas W. Krise
Chair, Board of Directors, RCUOG

**High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT)
Tomography Scanner and Support Services**

DATE ISSUED: November 1, 2021

ISSUED BY: RCUOG
TEL: 671-735-0249

Email: mconner@triton.uog.edu

INSTRUCTIONS TO BIDDERS

1. RECEIPT AND OPENING OF BIDS: Sealed bids for **RCUOG BID NO. 21-01 High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT) Tomography Scanner and Support Services** must be received by the RCUOG offices in Mangilao, Guam, signed and sealed in an envelope addressed to or emailed to RCUOG no later than:

TIME: 2:00 P.M.

DATE: Monday, November 22, 2021

Bids submitted after the time and date specified above shall be rejected.

Attention is called to the fact that bidders not only offer to assume the obligations and liabilities imposed upon the contractor in the form of a contract but are expressly made certain of the representations and warrants made herein. No effort is made to emphasize any particular provision of the contract, but bidders must familiarize themselves with every provision and its effect. This bid is subject to **General Terms and Conditions of the Invitation for Sealed Bids (Attachment A)**, the **Special General Provisions (Attachment B)**, and **High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT) Tomography Scanner and Support Services (Exhibit A)**.

In consideration of the expense of RCUOG of opening, tabulating, and evaluating this and other bids, and other considerations, the undersigned agrees that this bid shall remain firm and irrevocable within thirty (30) calendar days from the date of opening to supply any or all of items for which prices are quoted.

2. BIDDER'S QUALIFICATIONS (Attachment C): RCUOG may require a bidder to present satisfactory evidence that he/she has sufficient experience, and he/she is fully prepared, thus it is required that the bidder completely fill out the Bidder's Qualifications Form.

3. NON-COLLUSION AFFIDAVIT (Attachment D): Each person submitting a bid for any portion of the work covered by the bidding documents shall execute an affidavit, in the form provided with the bid, to the effect that they have not colluded with any other person, firm or corporation with regard to any bid submitted. Such affidavit shall be attached to the proposal.

4. MAJOR SHAREHOLDERS AFFIDAVIT (Attachment E): As a condition to submitting of bids or proposals, any partnership, sole proprietorship or corporation doing business with the Research Corporation of the University of Guam shall submit an affidavit that lists the name and address of any person who has held more than ten percent (10%) of outstanding shares in said partnership, sole

proprietorship or corporation at any time during the twelve (12) month period immediately preceding submission of a proposal. The affidavit shall contain the number of shares or the percentage of all assets of such partnership, sole proprietorship or corporation which have been held by each person during the twelve (12) month period. In addition, the affidavit shall contain the name and address of any person who has received or is entitled to receive a commission, gratuity or other compensation for the procuring or assisting in obtaining business related to the bid or proposal for the bidder and shall contain the amounts of any commission, gratuity, or other compensation. The affidavit shall be open and available for inspection and copying.

5. AFFIDAVIT RE GRATUITIES, KICKBACKS AND FAVORS (Attachment F): The bidder represents that it will not violate the prohibition against gratuities and kickbacks and favors set forth in the RCUOG Handbook and Policy Manual and the Code of Federal Regulations §200.318 General procurement standards.

6. AFFIDAVIT RE ETHICAL STANDARDS (Attachment G): The bidder represents that it has not knowingly influenced and promises that it will not knowingly influence a government employee to breach any of the ethical standards set forth in 5 GCA, Chapter 5, Article 11, or RCUOG employee as stated in the RCUOG Handbook and Policy Manual.

7. COVENANT AGAINST CONTINGENT FEES (Attachment H): The prospective bidder represents as part of his/her bid or proposal that such bidder has not retained any person or agency on a percentage, commission, or other contingent arrangement, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business.

8. DECLARATION RE COMPLIANCE WITH U.S. DEPARTMENT OF LABOR WAGE DETERMINATION (Attachment I): Each bidder certifies that any of its employees whose purpose, in whole or in part, is the direct delivery of service contracted by RCUOG shall be paid in accordance with the regulations issued and promulgated by the U.S. Department of Labor for such labor as is employed in the direct delivery of contract deliverables to RCUOG, including health and other similar benefits.

9. RIGHT TO ACCEPT AND REJECT BIDS: The Chair of the Board of Directors of RCUOG reserves the unqualified right, in his sole and absolute discretion, to reject any and all bids, or to accept that bid or combination of bids, if any, which in his sole and absolute judgment will, under all circumstances, best serve the interests of RCUOG. In the event that the successful bidder fails to execute the contract upon his part or to furnish a satisfactory performance, RCUOG reserves the option to accept the bid of any other bidder within ten (10) days from such default, in which case such acceptance shall have the same effect as to such bidder as though he was the originally successful bidder.

10. MODIFICATIONS PRIOR TO DATE SET FOR OPENING BIDS: RCUOG reserves the right to revise or amend the specifications prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by an amendment or amendments to this Invitation for Bid and shall be identified as such. It is required that the bidders acknowledge in writing receipt of all amendments issued and such acknowledgment must be included in the bid. The amendment shall refer to the portions of the Invitation for Bid it amends. Amendments shall be sent to all prospective bidders known to have received an Invitation for Bid. Amendments shall be distributed within a reasonable time to allow prospective bidders to consider the amendment in preparing their bids. If the time and date set for receipt of bids will not permit such preparation, such time shall be increased to the extent possible in the amendment or, if necessary, by facsimile, email or telephone and confirmed in the amendment.

11. CANCELLATION OF SOLICITATION: Prior to the date set for opening bids, a solicitation may be

cancelled in whole or in part when the RCUOG Executive Director or Chair of the RCUOG Board of Directors determines in writing that the cancellation of the solicitation is in RCUOG's best interest in accordance with RCUOG's procurement policy.

12. METHOD OF AWARD: Bid shall be awarded to the lowest responsible and responsive bidder whose bid meets the specifications, requirements and criteria set forth in the Invitation for Bid. A responsive bidder is one who has the capability in all respects to perform fully the contract requirements, and the integrity and reliability which will assure good faith performance. A responsive bidder is one who has submitted a bid which conforms in all material respects to the Invitation for Bid. RCUOG reserves the right to waive any minor information of irregularity in bids received. The RCUOG Executive Director or Chairman of the RCUOG Board of Directors shall have the authority to award or reject bids, in whole or in part for any one or more items if he determines it is in the public interest.

Award issued to the lowest responsible, and responsive bidder within the specified time for acceptance as indicated in the bid, results in a binding contract without further action by either party provided the successful bidder executes a formal contract with RCUOG.

13. SUBMISSION OF BIDS:

Bids and modifications thereof shall be enclosed in sealed envelopes and mailed via USPS certified mail, FedEx, UPS, DHL or other service to the mailing address below:

**Chief Business Officer
Research Corporation of the University of Guam (RCUOG)
303 University Drive
Mangilao, Guam 96913 USA**

Or

Emailed to mconner@triton.uog.edu as a password protected PDF file with a file password provided

Only written bids will be accepted as per the RCUOG procurement policy. The bidder shall include their name and address and the bid number on the face of the sealed envelope or on the coversheet of the PDF file.

14. PRE-BID CONFERENCES. Pre-Bid conferences will be permitted any time prior to the date established herein for submission of bid. The conferences will be conducted only to explain the procurement requirements for this IFB. RCUOG will notify all bidders of any substantive clarification provided in response to any inquiry. RCUOG will extend the due date if such information significantly amends the solicitation or makes compliance with the original proposed due date impractical.

15. BID PACKET. The prospective bidder is required to read each and every page of the bid packet and by the act of submitting a proposal shall be deemed to have accepted all conditions contained therein. In no case will failure to inspect constitute grounds for claim or for the withdrawal of a bid after opening. Bid submission shall be filled out in ink or typewritten and signed in ink. Erasures or other changes in a bid must be explained or noted over the signature of the offeror. Bid submission containing any conditions, omissions, unexplained erasure or alterations or items not called for in the bid packet, or irregularities of any kind may be rejected by the RCUOG as being incomplete.

16. NOTICE OF AWARD. RCUOG will notify all bidders the status of the Bid and intent to award ten days after the notification of award is approved by the RCUOG Executive Director or Chair of the RCUOG Board of Directors. Written notice of award will be made no later than 5:00 p.m. on November 29, 2021 and will be made public information and part of the contract file.

ATTACHMENT A
GENERAL TERMS AND CONDITIONS OF THE INVITATION FOR SEALED BIDS

- 1. COMPLIANCE WITH SPECIFICATIONS:** Bidder should comply with specifications outlined.
- 2. LATE BIDS, LATE WITHDRAWALS, AND LATE MODIFICATIONS:**
Any bid received after the time and date set for receipt of bids is late. Any withdrawal or modification of a bid received after the time and date set for opening of bids at the place designated for opening is late. (RCUOG Procurement Policy, Section 3, IV).
- 3. DETERMINATION OF LOWEST RESPONSIBLE BIDDERS:** In determining lowest responsible bidder, the University shall be guided by the following:
 - (a) Price of bid items.
 - (b) The ability, capacity, and skill of the bidder to perform.
 - (c) Whether the bidder can perform promptly or within the specified time.
 - (d) The character, integrity, reputation, judgment, experience, and efficiency of the bidder.
 - (e) The quality of performance of the bidder with regards to awards previously made to him.
 - (f) The previous and existing compliance by the bidder with laws and regulations relative to procurement.
 - (g) The sufficiency of the financial resources and ability of the bidder to perform.
 - (h) The quality, availability, and adaptability of the supplies for the use of the subject of the award.
 - (i) The ability of the bidder to provide future maintenance and services for the use of the subject of the award.
 - (j) The number and scope of the conditions attached to the bid.
- 4. LOW TIE BIDS:** Low tie bids are low responsive bids from responsible bidders that are identical in price and which meet all the requirements and criteria set forth in the Invitation for Bid. The Evaluation Committee will review and evaluate the bids and make a recommendation to award the bidder whose proposal best serves the interests of the University of Guam and RCUOG.
- 5. [N/A] TAXES:** Bidders are cautioned that they are subject to Guam Business Privilege Taxes, including 4% Gross Receipt Tax and Guam Income Taxes on Guam Transactions. Specific information of taxes may be obtained from the Director of Revenue and Taxation.
- 6. [N/A] LICENSING:** Bidders are cautioned that RCUOG will not consider for award any bid offer submitted by a bidder who has not complied with Guam Licensing Law. Specific information on licenses may be obtained from the Director of Revenue and Taxation.
- 7. EQUAL EMPLOYMENT OPPORTUNITY:** Bidders must not to discriminate against any employee or applicant for employment because of race, creed, color or national origin. The bidder will take affirmative action to ensure that applicants are employed, and the employees are treated equally during employment without regard to their race, creed, color, or national origin.
- 8. DETERMINATION OF RESPONSIBILITY OF BIDDER:** The Research Corporation of the University of Guam reserves the right for securing from bidders information necessary to determine whether or not they are responsible and to determine the responsibility in accordance with Section 3 of the General Terms and Conditions.

9. JUSTIFICATION OF DELAY: Vendors who are awarded items under the bid guarantee that the goods will be delivered to their destination within the time specified. If the vendor is not able to meet the specified delivery date, he is required to notify the purchasing agent of such delay. Notification shall be in writing and should be received by the agent at least twenty-four (24) hours before the specified delivery date. Notification of delay shall include an explanation of the causes and reasons for the delay including statement(s) from supplier or shipping company causing the delay. RCUOG reserves the right to reject delay justification if in the opinion of the RCUOG Executive Director such justification is not adequate.

10. EQUAL OPPORTUNITY EMPLOYER AND PROVIDER: RCUOG complies with all federal and local statutes, rules and regulations which prohibit discrimination in its policies and practices and direct affirmative action, including but not limited to Titles VII and IX of the Civil Rights Act of 1964 (as amended), Executive Order 11246, and the Equal Pay act of 1963 (as amended). RCUOG shall promote a full realization of equal opportunity through a positive, continuing program, including a requirement that those doing business with the RCUOG also are equal opportunity employers.

11. EMPLOYMENT RESTRICTION: If a contract for services is awarded to the bidder, then the service provider must warrant that no person in its employment who has been convicted of a sex offense under the provisions of Chapter 25 of Title 9 of the Guam Code Annotated or of an offense defined in Article 2 of Chapter 28 of Title 9 of the Guam Code Annotated, or who has been convicted in any other jurisdiction of an offense with the same elements as heretofore define, or who is listed on the Sex Offender Registry, shall provide services on behalf of the service provider while on University of Guam property, with the exception of public highways. If any employee of a service provider is providing services on University property and is convicted subsequent to an award of a contract, then the service provider warrants that it will notify RCUOG of the conviction, within twenty-four (24) hours of the conviction, and will immediately remove such convicted person from providing services on University property. If the service provider is found to be in violation of any of the provisions of this paragraph, then RCUOG will give notice to the service provider to take corrective action. The service provider shall take corrective action within twenty-four (24) hours of notice from RCUOG, and the service provider shall notify RCUOG when action has been taken. If the service provider fails to take corrective steps within twenty-four hours of notice from RCUOG, then RCUOG in its sole discretion may suspend temporarily any contract for services until corrective action has been taken.

12. INDEPENDENT CONTRACTOR: Contractor shall operate its business as an independent contractor and shall discharge all of its duties as such. No act performed or representation made, whether oral or written by Contractor with respect to third parties shall be binding on RCUOG.

13. INDEMNITY: Contractor agrees to indemnify and hold harmless RCUOG and its officers and employees from any claim, damage, liability, injury, expense, or loss, including defense costs and attorney's fees, arising out of Contractor's duties under this agreement resulting from Contractor's negligence, save and except those caused by the negligence on the part of RCUOG.

**ATTACHMENT B
SPECIAL GENERAL PROVISIONS**

- 1. GENERAL INTENTION:** It is the declared and acknowledged intention and meaning of this Special General Provision for the bidder to provide the Research Corporation of the University of Guam with materials, supplies, or equipment completely assembled, and ready for use.
- 2. COMPETENCY OF BIDDERS:** Bids will be considered only from such bidders who, in the opinion of the Research Corporation of the University of Guam, can show evidence of their ability, experience, and facilities to render satisfactory service.
- 3. CONTACT FOR CONTRACT ADMINISTRATION:** If your firm receives a contract as a result of this invitation, please designate a person whom we may contact for prompt administration.

NAME: _____ **TITLE:** _____

NAME OF COMPANY: _____ **ADDRESS:** _____

TEL: _____ **FAX:** _____ **E-Mail Address:** _____

- 4. INSPECTION:** All supplies, materials, or equipment delivered under this contract shall be subject to the inspection and testing conducted by RCUOG at destination. If, in any case, the supplies, materials, or equipment are found to be defective in material, workmanship, performance or otherwise does not conform to the specifications, RCUOG shall have the right to reject the items or require that they be corrected. The number of days required for correction will be determined by RCUOG.
- 5. BID FORMS:** Bid forms are posted on the RCUOG website at www.uog.edu/rcuog under the subhead: BIDS.
- 6. BID ENVELOPE:** Bid envelopes shall be sealed and marked with the bidder's name, address, and bid invitation number. An original and a copy of the bid submission must be in the bid envelope. Or password protected bids may be emailed to mconner@triton.uog.edu with a cover sheet including the bidder's name, address, and bid invitation number.

NOTE: UNDER NO CIRCUMSTANCES WILL LATE BIDS BE ACCEPTED BY THIS OFFICE.

- 7. RECEIPT, OPENING AND RECORDING OF BIDS:** Bids and modifications shall be publicly opened in the presence of one or more witnesses, at the time, date, and place designated in the Invitation for Bid. The name of each bidder, the bid price, and such other information as is deemed appropriate by the RCUOG Procurement Officer, shall be read aloud and recorded, or otherwise made available. The names and addresses of required witnesses shall be recorded at the opening. The opened bids shall be available for public inspection except to the extent the bidder designates trade secrets or other proprietary data to be confidential as set forth in accordance with Section 8, below. Materials so designated shall accompany the bid and shall be readily separable from the bid in order to facilitate public inspection of the non-confidential portion of the bid. Prices, makes, and models or catalogue numbers of the items offered, deliveries, and terms of payment shall be publicly available at the time of bid opening regardless of any designation to the contrary.
- 8. CONFIDENTIAL DATA:** The RCUOG Procurement Officer shall examine the bids to determine the

validity of any requests for nondisclosure of trade secrets and other proprietary data identified in writing. If the parties do not agree as to the disclosure of data, the RCUOG Procurement Officer shall inform the bidders in writing what portions of the bid will be disclosed and that the bids will be so disclosed. The bids shall be opened to public inspection subject to any continuing prohibition on the disclosure of confidential data.

9. INQUIRIES: All inquiries or questions and concerns must be submitted to the RCUOG Executive Director in writing via email at cmoore@triton.uog.edu. Oral communications will not be considered.

**ATTACHMENT C
BIDDER'S QUALIFICATIONS**

To be submitted in accordance with the provisions set forth in the INSTRUCTIONS TO BIDDERS contained in the bidding documents for the project.

The undersigned bidder makes the following representations relating to its proposal to RCUOG.

The word "it", used herein by way of reference to the undersigned, shall be deemed to mean "he or she" if the bidder is an individual and "they" if the bidder is a partnership

1. It maintains a permanent place of business at

2. STANDARD FOR DETERMINATION OF QUALIFIED BIDDER: In order to qualify as a responsible bidder, a prospective bidder must meet the following standards as they relate to the particular procurement under consideration:

- (a) Has adequate financial resources for performance or has the ability to obtain such resources as required during performance.
- (b) Has the necessary experience, organization, technical qualifications, skills, and facilities, or has the ability to obtain them.
- (c) Is able to comply with the proposed or required performance schedule.
- (d) Has a satisfactory record of integrity, judgment, and performance.
- (e) Must be able to conform to the requirements of the Equal Employment Opportunity Act.

3. It hereby represents and warrants that all statements set forth herein are true and correct. (If the bidder is a partnership, the partnership name must be signed, followed by the signature of at least one of the partners. If the bidder is a corporation, the corporate name must be signed, followed by the signature of a duly authorized officer and the corporate seal affixed. A typewritten copy of all such names and signatures shall be appended. No alterations, erasures, corrections, or interlineations will be permitted).

NAME OF BIDDER

**ATTACHMENT D
AFFIDAVIT re NON-COLLUSION**

CITY OF _____)
) ss.
STATE/TERRITORY)

_____ (state name of affiant signing below), being first
duly sworn deposes and says that:

1. The name of the offering company or individual is (state name of company)

2. The proposal for the solicitation identified above is genuine and not collusive or a sham. The bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any other bidder or person, to put in a sham proposal or to refrain from making an offer. The bidder has not in any manner, directly or indirectly, sought by an agreement or collusion, or communication or conference, with any person to fix the proposal price of bidder or of any other offeror, or to fix any overhead, profit or cost element of said proposal price, or of that of any other bidder, or to secure any advantage against the Research Corporation of the University of Guam or any person interested in the proposed contract. All statements in this affidavit and in the proposal are true to the best of the knowledge of the undersigned. This statement is made pursuant to 2 GAR Division 4 § 3126(b).

3. I make this statement on behalf of myself as a representative of the offeror, and on behalf of the offeror’s officers, representatives, agents, subcontractors, and employees.

Signature of one of the following:
Offeror, if the offeror is an individual;
Partner, if the offeror is a partnership;
Officer, if the offeror is a corporation

Subscribed and sworn to before me

This _____ day of _____, 20__

NOTARY PUBLIC
My commission expires _____, _____

**Attachment H
AFFIDAVIT re CONTINGENT FEES**

CITY OF _____)
) ss.
STATE/TERRITORY)

_____ (state name of affiant signing below), being first duly sworn,
deposes and says that:

1. The name of the offering company or individual is (state name of company)
_____.
2. As a part of the offering company's bid or proposal, to the best of my knowledge, the offering company has not retained any person or agency on a percentage, commission, or other contingent arrangement to secure this contract.
3. As a part of the offering company's bid or proposal, to the best of my knowledge, the offering company has not retained a person to solicit or secure a contract with RCUOG upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies for the purpose of securing business.
4. I make these statements on behalf of myself as a representative of the bidder, and on behalf of the bidder's officers, representatives, agents, subcontractors, and employees.

Signature of one of the following:
Bidder, if the bidder is an individual;
Partner, if the bidder is a partnership;
Officer, if the bidder is a corporation

Subscribed and sworn to before me

This ____ day of _____, 20__

NOTARY PUBLIC
My commission expires _____, _____

Attachment I
DECLARATION re COMPLIANCE WITH U.S. DOL WAGE DETERMINATIONS

Procurement No.: _____

Name of Offeror Company: _____

I, _____ hereby certify under penalty of perjury:

- (1) That I am _____ (please select one: the offeror, a partner of the offeror, an officer of the offeror) making the bid or proposal in the foregoing identified procurement;
- (2) That I have read and understand the provisions of 5 GCA § 5801 and 5802 which read:

§ 5801. Wage Determination Established.

In such cases where the government of Guam enters into contractual arrangements with a sole proprietorship, a partnership or a corporation ("contractor") for the provision of a service to the government of Guam, and in such cases where the contractor employs a person(s) whose purpose, in whole or in part, is the direct delivery of service contracted by the government of Guam, then the contractor shall pay such employee(s) in accordance with the Wage Determination for Guam and the Northern Mariana Islands issued and promulgated by the U.S. Department of Labor for such labor as is employed in the direct delivery of contract deliverables to the government of Guam.

The Wage Determination most recently issued by the U.S. Department of Labor at the time a contract is awarded to a contractor by the government of Guam shall be used to determine wages, which shall be paid to employees pursuant to this Article. Should any contract contain a renewal clause, then at the time of renewal adjustments, there shall be made stipulations contained in the contract for applying the Wage Determination, as required by this Article, so the Wage Determination promulgated by the U.S. Department of Labor on a date most recent to the renewal date shall apply.

§ 5802. Benefits.

In addition to the Wage Determination detailed in this Article, any contract to which this Article applies shall also contain provisions mandating health and similar benefits for employees covered by this Article, such benefits having a minimum value as detailed in the Wage Determination issued and promulgated by the U.S. Department of Labor, and shall contain provisions guaranteeing a minimum of ten (10) paid holidays per annum per employees.

- (3) That the offeror is in full compliance with 5 GCA § 5801 and § 5802, as may be applicable to the procurement referenced herein;
- (4) That I have attached the most recent wage determination applicable to Guam issued by the U.S. Department of Labor. Download from www.wdol.gov (INSTRUCTIONS – Please attach).

Signature

EXHIBIT A
RCUOG
Invitation for Bid RCUOG BID NO. 21-01
High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT)
Tomography Scanner and Support Services

The Guam NSF EPSCoR RII Track-1 project, the Guam Ecosystems Collaboratorium for Corals and Oceans (GECCO), has implemented a systematic research agenda incorporating new knowledge of biodiversity, population genetics, genomics, phylogenetics, ecology, microbiology, oceanography, and mathematical modeling to document and predict the taxonomic and functional diversity of reef-builders and associated taxa in a changing environment. Biodiversity studies are key to this project, and morphological studies of fish, mollusk, crustacean, and other marine organisms are important to GECCO project. Utilization of cutting-edge tools, such as a micro-computed tomography scanner, and corresponding methodologies to document physical diversity in marine animals and plants so as to better understand their taxonomy and systematics, are important for meeting the goals and objectives of this project.

This scanner will be used for morphological studies in support of biodiversity investigations within the project’s Biorepository as specified in the NSF EPSCoR GECCO proposal, NSF award, and strategic plan. The equipment under this proposal is intended to drive independent research projects for University of Guam faculty members, post-doctoral fellows, research associates, graduate and undergraduate students, and visiting researchers in the biological sciences, especially the marine sciences.

BIDDERS ARE REQUIRED TO BID ON ALL OR NONE OF THE ITEMS REQUESTED.

| Item no. | Description | Qty | Unit | Unit Price (\$) |
|-----------------|--|------------|-------------|------------------------|
| 1 | High-Capacity 3D X-Ray Microscopy Micro-Computed (m-CT) Tomography Scanner and software | 1 | each | \$430,000 - \$600,000 |
| 2 | Warranty, Training, and Support Services, and Shipping | 1 | each | \$70,000 - \$125,000 |

MICRO-COMPUTER TOMOGRAPHY X-RAY SCANNER, COMPUTER, SOFTWARE, AND WARRANTY

SPECIFICATIONS:

High energy m-CT scanner with the following:

- X-ray source: 40-130 kV, 39 W max., 5 μ m spot size @ 4 W, air-cooled
- A 7-position automatic filter changer
- An X-ray detector with fast 6-megapixel (3072 x 1944) active pixel CMOS flat-panel in central or two offset positions
- Reconstructed slices format: 3072 x 3072 pixels (single detector position), 4800 x 4800 pixels (two offset positions)
- Resolution: 3 μ m isotropic pixel size, 5 μ m low-contrast resolution in 3D (>10% MTF)
- Maximum scanned volume: 250 mm in diameter, 250 mm in length
- Maximum object size: 300 mm in diameter, 500 mm in length, maximum object weight is 20 kg
- Shortest scanning cycle: < 15 sec
- Radiation safety: < 1 μ Sv / h at 10 cm from the instrument surface
- System dimensions: W 1250 mm x H 815 mm x D 820 mm, 450 k to fit a large table top
- Precision object manipulator for large (up to 300 mm in diameter, 500 mm in length) and heavy (up to 20 kg) objects with an integrated micro-positioning stage.
- Specimen holders with differently sized base plate (diameter 3 mm, 10 mm, 25 mm and 50 mm) that fit to the micro-positioning stage and a clamping disc for larger samples. Additional clamps for mounting even larger samples directly to the base plate and carbon rods that can be installed to support holding the sample.
- Cooling stage should allow for micro-CT scanning under controlled object temperature below ambient. The cooling stage keeps an object at sub-zero temperature, down to 30-40°C below ambient. An internal microprocessor should control a solid-state cooling or heating system and measures the object's temperature.

The bid must include a Computer Workstation which should include the following:

- Intel Xeon W-2265: 12C, 3.5GHz, 19.25 MB Cache • 128GB, 2933MHz DDR4 memory • 16 GB NVIDIA® Quadro® Graphical card • 4x 2 TB PCIe NVMe Class 40 SSD in RAID 0 for data • 512 GB SATA Class 20 SSD for operating system and software • DVD+/- RW drive • One 24" LCD/LED monitor, 1920 x 1200 native resolution • Windows 10 Professional (64-bit) English • QWERTY keyboard • Optical scroll mouse • Sound bar
- Connection to computer: digital signal from flat panel sensor to frame grabber installed in PC + one USB2 connection. The system should "wake-up" from USB port activation when the control software is started and can be switched OFF completely together with PC by control software.
- Image processing software packages that provide fast volumetric reconstruction, 2D/ 3D quantitative analysis and surface rendering visualization, realistic visualization, and ability to create movies by volume rendering with the possibility for virtual flight around and inside the reconstructed object's microstructure.

- GPU-accelerated reconstruction for round and helical scanning geometries using an exact reconstruction algorithm.
- Ability to send reconstruction results to iPad, iPhone or Android devices.
- Special software for mobile platforms that can perform volume rendering and virtual cut of objects with touch screen gesture controls.
- Acquisition software for camera control, obtaining shadow images and series of angular projections for reconstruction, and acquisition parameter control including different sets of measurement protocols.
- Graphical Windows user interface.
- Reconstruction software should allow for single PC use with GPU acceleration. The software should allow for the use of a modified Feldkamp multi-slice volumetric (cone-beam) reconstruction algorithm for round scanning trajectory and exact reconstruction algorithm for helical (spiral) scanning. Software should allow for single slice or selected / full volume reconstruction after one scan. Software should also allow for full cross section size (full image mode), partial reconstruction mode, and possibility for detail local reconstruction with object larger than field of view. Software should allow for automatic misalignment correction, ring artefact correction, adjustable smoothing, beam hardening correction, detector's dead pixel correction, drift compensation, reconstruction from circular or spiral (helical) acquisition, automatic reconstruction from number of partial scans of long objects, drawing rulers, automatic and manual selection for grey-scale window, etc. Software output file formats should include 16bit TIFF, 24bit (greyscale) JPEG, 8-bit BMP, PNG, and text formats. The software should be supplied with two types of reconstruction engines which are switchable by operator: multithread reconstruction using only the CPU with reconstruction accelerated by NVidia GPU. Visualization software should provide reconstructed sets of slices can be flexibly viewed in a viewing program. Images are displayed as a slice-by-slice movie. The viewing software should also have a viewing mode with three intersecting orthogonal slices centered at any selected point inside the reconstructed volume, which can be turned and each intersecting slice independently moved by mouse control. The viewing software should include the possibility to rotate a reconstructed volume around any axis and resample reconstructed dataset in any alternative orientation. Additional features should include 4th dimension to display time-resolved tomography for visualization of dynamic object behavior under applying pressure, tension or temperature variations. The software should also include variable smoothing kernels, saving interpolated datasets in sagittal or coronal directions, measuring and saving distances and intensity profiles. The software should also allow for automatic co-registration of datasets with extraction of differential information to new dataset
- The software should also have a format converter that converts between TIFF, BMP and JPEG files with adjustment of color palette, inversion, renaming, resizing and combining of datasets. The converter should provide conversion from a set of reconstructed slices to file(s) in the convertor's format.
- There should be morphological analysis software that measures comprehensive 2D and 3D morphometric parameters. The software should feature an advanced, rapid and user-friendly region of-interest (ROI) free-hand selection tool, which by auto-interpolation between layers becomes the volume-of-interest (VOI), the essential basis

for all quantitative analysis. CT density analysis should also be provided within any VOI, which by calibration can provide Hounsfield units or volumetric bone mineral density. The 3D models created by CT-analyzer should be loaded and viewed with the accompanying CT-volume software. The CT-analyzer software should allow for flexible dataset opening including variable resizing and conversion from formats of other micro-CT producers, use of the slice tool for density profile and longitudinal section from transverse sections, creation of rapid and user-friendly region-of-interest (ROI) resizable standard shapes and the use of the free-hand selection tool, and auto-interpolation between layers to give the volume-of-interest (VOI). The software should save VOI selections and VOI-sampled datasets, provide a flexible binarization tool that produces a linear/logarithmic grey histogram, and provide outputs as grey histograms from selected VOI for density measurements (HU, BMD). The software should also allow for the creation of 3D triangularized surface rendering for precise 3D viewing, render in full reconstructed space or volume of interest, and the possibility to create STL models suitable for finite element analysis and 3D printing. The software package should also allow for the creation of customizable printed analysis reports, the creation of task lists, and also support batch mode and user plug-ins functions. The software should provide viewing, intuitive manipulation, and flexible control of 3D-model texture and transparency, have a versatile moviemaker. The CT-volume function should have the ability to load triangulated models created in the CT-analyzer using different formats including STL. A virtual 3D viewing environment that allows for the election of background including scenery, moving and rotation of single or multiple models (together or separately) and control of an object's texture, color, lighting and transparency. There should also be the ability to view inside models by cutting away a part or making it transparent.

- A "flight recorder" system for flexible and fast creation of "movies" for animated presentation of scanned objects in a 3D virtual environment by automatic interpolation between several selected key frames should be part of the package. This should also allow for stereo imaging using red-green or red-cyan glasses, 3D visualization, based on volume rendering (as opposed to surface rendering for CTVol). That works directly on the reconstructed cross sections. Features and navigation should include 3D navigation controls that allow manipulating both object and camera, and a flexible clipping tool that allows for the production of cut-away views. At least three different rendering modes should be supported (volume render, maximum intensity projection = MIP, attenuation maps), with a transfer function editor that can be used to control appearance during rendering.
 - Background selection, including custom scenery. A "flight recorder" function should also allow for the fast creation of "fly around" and "fly through" animations based on the selection of several key frames with automatic interpolation in between, and 3D stereo viewing.
 - There should be an ability to export datasets to mobile devices (iPhone, iPad, iPod, and mobiles running Android) for volume rendering, virtual manipulation and cutting.
- All software provided should be as a site license with free updates for the life of the instrument.

- The entire m-CT system should have a 1-year extended warranty.
- Post-purchase requirements include onsite system installation, onsite training (at least 3-days on-site initial training for up to 5 people), and unlimited phone, email, and online support for the instrument for the life of the instrument. Support for the computer workstation should be provided by the computer manufacturer.

WARANTY PERIOD: Minimum of one-year; a three-year service contract along with a price for an optional yearly service contract per year for an additional two years must be included in the bid price.

WARRANTY: Manufacturers standard warranty must be a minimum of one-year

BIDDING ON: _____

MANUFACTURER: _____

MAKE: _____

MODEL: _____

YEAR: _____

PLACE OF ORIGIN: _____

DATE OF DELIVERY: _____

PAYMENT TERMS: 25% upon bid award, 25% upon delivery, and the remaining 50% upon acceptance of installment and training.

NOTE: NAME AND TITLE OF AUTHOR OF SPECIFICATIONS:

Dr. Terry J. Donaldson, Professor of Ichthyology, Principal Investigator/Project Director, Guam NSF-EPSCoR

Procurement Officer: Michael Conner Email: mconner@triton.uog.edu

OTHER NOTES:

1. These specifications have been written to describe minimum system and performance requirements to be supplied by the equipment manufacturer bidding. Reasonable tests may be conducted upon delivery before acceptance.
2. The successful bidder shall furnish all necessary and desirable information and instruction for the proper operation of the system.
3. RCUOG reserves the right to accept and/or reject any and all bids, to waive any defects, irregularities, or specification discrepancies and to award the bid deemed to be in the best interest of the University of Guam and RCUOG.

4. Certificate of Origin is required to be provided to RCUOG at the time of delivery of the system.
5. Manufacturer's brochure (original) shall be submitted and attached on bid proposal.