



## 66 -- Ultra High Vacuum Ga Ion Column

### General Information

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### Contracting Office Address

Department of the Navy, Office of Naval Research, Naval Research Laboratory, 4555 Overlook Ave.  
S.W., Washington, DC, 20375

### Description

This is a combined synopsis/solicitation for commercial items prepared in accordance with the format in Federal Acquisition Regulations (FAR) Subpart 12.6, as supplemented with additional information included in this notice. This announcement constitutes the only solicitation; proposals are being requested and a written solicitation will not be issued. The solicitation, N00173-05-R-LS03, is issued as a Request for Proposal (RFP). The solicitation document and incorporated provisions and clauses are those in effect through FAC 2005-05(I,II,IV,VI), DFARS change 20050726; Class Deviation 2005-D0001 & NMCARS(03-6). The associated small business size standard is 500 employees. NRL has a requirement for the following: Contract Line Item Number (CLIN) 0001, An Ultra High Vacuum (UHV) Ga Ion Column for Scanning Auger Microscope and Secondary Ion Mass Spectroscopy (SIMS); SubCLIN 0001AA UHV Ion Column, 1 EA; SubCLIN 0001AB Installation, 1 LO; SubCLIN 0001AC Training, 1 LO; CLIN 0002 Operation and Maintenance Manuals, 1 LO. The aforementioned requirements shall be provided in accordance with the following specifications. The contractor shall

deliver an Ultra High Vacuum (UHV) liquid metal high resolution (less than 50 nm beam) ion column. The contractor shall install the system inside a scanning auger microscope (Physical Electronics Model PHI-660) which will be used for secondary ion mass spectroscopy and secondary electron imaging at the Naval Research Laboratory (NRL), Washington, DC. The system will be set-up in a "quiet room" located in the Nanoscience Institute Facility, Bldg. 250, Naval Research Laboratory (NRL), Washington DC 20375. The laboratory space will have 110 Volts alternating current (VAC) and 220 VAC, single phase, 60 Hertz (Hz) electrical power. The contractor shall connect the system plumbing, gas lines, and electrical fixtures, which will be available in the designated location. The UHV ion column must be capable of achieving high resolution ion beams (less than 50 nm) as applicable to secondary ion mass spectroscopy (SIMS), which can only be achieved with a doubly focused liquid gallium ion column assembly. The tool must be configured with a beam blanking system. The focused ion beam must be capable of external control of steering using highly-stable, analog voltages (plus or minus 15V) as well as external control of beam blanking using analog voltages for rastering arbitrary focused ion beam patterns generated by external voltages. The Required System Features are as follows: The system must be compatible with chamber pressures less than 1.0 E-10 torr (i.e. UHV system); The system must be bakeable to 180 degrees Celsius; The system must contain integrated beam steering, stigmation, and beam blanking; The focused (less than 50 nm) ion beam position on the sample must be able to be controlled in X and Y using two external voltage sources. 1 mm deflection of the ion beam must be possible in both X and Y directions using external voltage sources. The purpose of controlling the beam position is for ion beam lithography, and thus the beam deflection must be suitable for a range of lithography write field areas from 1 mm maximum deflection to less than 0.1 micron area; The system must have a manually variable aperture with at least 5 discretely selectable apertures; The system must be able to focus on samples with working distances from 5 to 25 mm from lens to sample; The ion column must be capable of producing a beam diameter of less than 50 nm at 25 kV; The ion column must be capable of continuously variable beam acceleration voltage from 10 kV to 25 kV; The ion column must be capable of continuously variable beam current of less than 20 pA to greater than 20 nA; The tool must be configured with an electrostatic beam blanking system suitable for ion beam lithography; The system must be capable of producing neutrals for analysis in secondary ion mass spectrometer as well as producing secondary electrons for imaging of sample surface; And the system must be compatible with the currently configured system (Physical Electronics Model PHI-660), which includes an electron column, secondary electron detector, secondary ion mass spectrometer (Hiden Analytical SIM Probe 300), and Ar-ion sputter beam. The Contractor shall install and set-up the ion column and electronics into an existing scanning auger microscope. Installation must not interfere with other working elements of the currently configured system (Physical Electronics Model PHI-660), which includes an electron column, secondary electron detector, secondary ion mass spectrometer (Hiden Analytical SIM Probe 300), and Ar-ion sputter beam. The contractor shall provide training to include focusing the ion column, beam control, and to demonstrate the requirements listed in this document at the NRL. The system must be shipped with two (2) complete sets of operation and maintenance manuals, one set should be printed and the other on CD-Rom. The documentation must contain: full operational instructions suitable for use in teaching new users; gas, water, air, and vacuum schematics; electrical wiring schematics; complete mechanical schematics suitable to guide future modifications and repairs; troubleshooting manual for common servicing and repairs of electrical, mechanical, and computer software problems. The system must have a standard commercial warranty (1 year covering parts and labor). Delivery and acceptance is at NRL, Washington, D.C. 20375, FOB Destination. Delivery shall be no later than 90 days from date of award. The provision at 52.212-1, Instructions to Offerors--Commercial, applies to this acquisition. The provision at FAR 52.212-2, Evaluation--Commercial Items is incorporated and completed as follows: The Government intends to award a contract resulting from this solicitation to that responsible offeror whose offer conforming to the solicitation will be the most advantageous to the Government, price and other factors considered. The following factors shall be used to evaluate the offers: (i) Technical capability of the item offered to meet the Government's requirements.; (ii) Price; and (iii) Past Performance. The aforementioned evaluation criteria are listed in descending order of importance. Offeror must complete and submit with its proposal, FAR 52.212-3 Offeror Representations and Certifications--Commercial Items and DFARs 252.212-7000 Offeror Representations and Certifications-Commercial Items, which are identified as B and available

electronically at: <http://heron.nrl.navy.mil/contracts/repandcerts.htm>. The clause at FAR 52.212-4, Contract Terms and Conditions-Commercial Items applies along with the following addenda: A. See aforementioned Delivery and Acceptance requirements. B. Reserved; C. Authorized Government Representative ? To be completed at time of award; D. Electronic and Information Technology (EIT) In accordance with Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. 794d), all EIT supplies and services provided under this contract must comply with the applicable accessibility standards issued by the Architectural and Transportation Barriers Compliance Board at 36 CFR part 1194 (see FAR Subpart 39.2). Electronic and information technology (EIT) is defined at FAR 2.101. E. Requirements for On-Site Contractors ? For those portions of the work under this contract performed at any NRL site, the contractor shall comply with the Requirements for On-Site Contractors dated 30 July 2004, which are hereby incorporated by reference. The full text is available at <http://heron.nrl.navy.mil/contracts/home.htm>. F. Remittance Address ? to be completed at time of award. FAR 52.212-5, Contract Terms and Conditions Required To Implement Statutes or Executive Orders--Commercial Items, applies to this acquisition. The following additional clauses cited within this clause are applicable: 52.203-6, 52.219-4, 52.219-8, 52.222-3, 52.222-19, 52.222-21, 52.222-26, 52.222-35, 52.222-36, 52.222-37, 52.222-39, 52.225-13, 52.232-29, 52.232-30, 52.232-33, 52.239-1. The DFARs clause at 252.212-7001, Contract Terms and Conditions Required to Implement Statutes or Executive Orders Applicable to Defense Acquisitions of Commercial Items applies to this acquisition. The following additional clauses cited within this clause are applicable: 52.203-3, 252.225-7012, 252.225-7014, 252.225-7036, 252.227-7015, 252.232-7003, 252.243-7002, 252.247-7023, and 252.247-7024. In addition, the following FAR and DFARS clauses apply: 52.204-7, 52.214-31, 252.204-7004, and 252.211-7003. Any resultant contract will be DO Rated under the Defense Priorities and Allocations System (DPAS). The Contract Specialist must receive any questions no later than 10 calendar days before the response date of this solicitation. All responsible sources may submit a bid, proposal, or quotation, which shall be considered by the agency. An original and 2 copies of the offeror proposal shall be received on or before the response date noted above, 4:00 P.M., local time at the NRL address above, Attn: Contracting Officer. The package should be marked with the solicitation number, due date and time. The U.S. Postal Service continues to irradiate letters, flats, Express and Priority Mail with stamps for postage and other packages with stamps for postage destined to government agencies in the ZIP Code ranges 202 through 205. Due to potential delays in receiving mail, offerors are encouraged to use alternatives to the mail when submitting proposals. Other business opportunities for NRL are available at our website <http://heron.nrl.navy.mil/contracts/rfplist.htm>

## Point of Contact

Lisa Fleming, Contract Specialist, Phone 202-767-3739, Fax 202-767-6197, Email [lisa.fleming@nrl.navy.mil](mailto:lisa.fleming@nrl.navy.mil)

## Place of Performance

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Postal Code: 20375-5326  
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