NIST Requirements Document
Two ultra-low-noise lasers

I. Background/Purpose:

The research work of the Microsystems and Nanotechnology Division includes the development of nonlinear integrated photonics devices driven by continuous wave lasers. The noise performance of such devices depends on the noise performance of the continuous wave laser source. To support this research, two ultra-low-noise continuous wave laser sources (with the same nominal properties) are needed. These laser sources should be 'turnkey', that is, include all control electronics to achieve ultra-low-noise operation.

II. Minimum Requirements

The Contractor shall provide a Firm Fixed Price quotation for two ultra-low-noise laser systems. These systems must meet or exceed the technical specifications listed below. **All items must be new. Used or remanufactured equipment will not be considered for award. Experimental, prototype, or custom items will not be considered. The use of "gray market" components not authorized for sale in the U.S. by the proposer is not acceptable.** All line items shall be shipped in the original manufacturer's packaging and include all original documentation and software, when applicable.

Technical Specifications:

1. Two ultra-low-noise laser systems must be provided.
2. The center wavelength of each laser must be at 1550 nm (+/-15 nm). Stronger consideration will be provided if the lasers can reach the wavelength of 1556.2 nm.
3. The output power of each laser must be >100 mW, measured at the laser output
4. The Lorentzian linewidth (e.g., the fundamental linewidth) of each laser must be <250 Hz
5. The relative intensity noise (RIN) of each laser, measured at 10 MHz offset from the carrier must be, <-155 dBc/Hz
6. The sidemode suppression ratio of each laser must be >60 dB
7. Each laser must come with an output isolator provided at least 25 dB of isolation
8. Each laser must come with the ability to tune its center wavelength by at least 25 pm
9. Each laser must admit external AC and DC modulation of the laser current and slow modulation (e.g., DC to 1 Hz) of the laser temperature. The AC modulation bandwidth for the laser current must be at least 20 MHz.
10. Each laser must come in a benchtop housing that provides all electronics for control of laser temperature and current to achieve the specified performance above. Each benchtop housing must come with its own DC power supply that is fed by a standard 110 V wall outlet.
11. The laser output of each laser must be either a bulkhead FC/APC connector (attached to a polarization maintaining fiber in the laser housing interior) or pigtailed polarization maintaining optical fiber with FC/APC connector.
12. Each laser system must come with at least a 12 month warranty

III. Deliverables:

Delivery shall be FOB destination and shall occur within 100 days. FOB Destination means: The contractor shall pack and mark the shipment in conformance with carrier requirements, deliver the shipment in good order and condition to the point of delivery specified in the purchase order, be responsible for any loss of and/or damage to the goods occurring before receipt and acceptance of the shipment by the consignee at the delivery point specified in the purchase order; and pay all charges to the specified point of delivery. The contractor shall deliver all Line Items to:

National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, MD 20899-1640

IV. Inspection and Acceptance

In addition to the inspection and acceptance terms articulated in 52.212-4, the Government reserves the right to perform such performance tests and evaluations as defined below to verify specified system performance. Such tests and evaluations, if performed, shall be conducted within the environment that the system is to be operated. The Contractor has the right to be present during the tests and evaluations, if performed, at the Contractor's expense.

The place of acceptance shall be:

100 Bureau Drive
Building 216
Gaithersburg, MD 20899

V. Installation

Installation will be completed by the purchaser.

VI. Training

No in-person training is required. The vendor will provide any relevant videos, operating manuals, and other materials needed to use the equipment.

VII. Warranty

The contractor shall warrant the system and provide support for a minimum of one year after receipt of the software and shall be in accordance with terms in FAR 52.212-4

VIII. Payment Schedule

The Contractor shall be paid, in accordance with Net 30-day payment terms, upon receipt and acceptance of a proper invoice, in accordance with the following schedule:

1. 100% after receipt and acceptance by the TPOC of fully delivered system
2. The Government anticipates inspection will occur within two weeks of system delivery

NOTE: Partial shipments and partial invoices will not be accepted, unless other-wise requested and accepted by the Contracting Officer prior to award offer. Proposed payment schedules shall be submitted with vendor's response to the RFQ for consideration.