Voluntary Transparancy Notice
'CRYO TEM"

06-11-2026

Technische Universiteit Delft
Directie Finance
Afdeling Procurement

Postadres	Bezoekadres
Postbus 5	Stevinweg 1
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Voluntary transparency procedure.
Supply of a Cryo-TEM Microscope to TU Delft.

Introduction to TU Delft

Delft University of Technology (TU-Delft), is the largest and oldest Dutch public technological university, located in Delft, the Netherlands. It counts as one of the best universities for engineering and technology worldwide, typically seen within the top 20. It is repeatedly considered the best university of technology in the Netherlands. With eight faculties and numerous research institutes, it hosts over 26.000 students (undergraduate and graduate), around 3.000 academic staff, and 2.000 support and management, staff.

The Department of Bionanoscience at TU Delft focuses on the fundamental understanding of biological processes, from the level of single molecules to the full complexity of living cells. This research provides fascinating insight in the molecular mechanisms that lead to cellular function. Furthermore, it enables the in vitro bottom-up construction of cellular machinery and it impacts applications ranging from biomolecular diagnostics to novel antibiotics and targeted nanomedicine. The department features a strongly multidisciplinary and international team of scientists, whose research areas include Biomaterials and biomedicine, Biophysics of the genome, Molecular and evolutionary cell biology, Novel imaging and nanotechnology, Synthetic Cell and Theoretical biophysics and computational biology.

Current challenges and needs

The Department of Bionanoscience aims to expand its capabilities for high-resolution structural investigation of biological specimens under cryogenic conditions. An important research objective is to bridge the gap between conventional cryogenic electron microscopy, which is highly effective for structural analysis of isolated molecular complexes and thin specimens, and advanced imaging methods capable of investigating thicker biological samples.

To achieve this, the department requires a 300 kV cryogenic transmission electron microscope combining capabilities for established single-particle analysis and cryo-electron tomography with advanced scanning transmission electron microscopy (STEM), including low-dose 4D-STEM techniques. These complementary methods will enable the investigation of biological structures across different length scales while addressing limitations imposed by specimen thickness and radiation sensitivity. The microscope will operate as a shared research infrastructure and support both routine, automated data acquisition by multiple users across different experience levels and the development of new imaging methods.

The acquisition will replace the existing microscope and must provide a fully integrated platform for current and future research activities. The following minimum (KO) requirements have been established to ensure that the instrument meets these scientific and operational needs.

Market situation

The market for high-end 300 kV transmission electron microscopes capable of cryogenic imaging and advanced scanning transmission electron microscopy (STEM) is highly specialized, with only a limited number of manufacturers offering instruments in this category. Within this market, microscope platforms are generally optimized either for high-throughput cryogenic electron microscopy (cryo-EM), including single-particle analysis and cryo-electron tomography, or for advanced analytical STEM applications, including scanning diffraction and four-dimensional STEM (4D-STEM).

TU Delft requires a single 300 kV transmission electron microscope and camera configuration capable of supporting both conventional cryo-EM workflows and the development of advanced STEM-based imaging methods for biological specimens, including relatively thick cryogenic samples. The microscope must support automated single-particle analysis and cryo-electron tomography including an energy filter and direct electron detection camera, while also providing the hardware, detector and control capabilities required for low-dose 4D-STEM imaging. All these capabilities must be available within the same instrument and within the available project budget.

Based on its market assessment, TU Delft has identified the JEOL CRYOARM300S as the solution that meets this combination of requirements. The absence of reasonable technical alternatives within the project budget is assessed as follows:

1. **Combination of conventional brightfield TEM and advanced STEM functionality at cryogenic temperatures**

The proposed instrument must serve two complementary research objectives. First, it must support both conventional cryo-EM acquisition, including automated single-particle data acquisition and cryo-electron tomography over extended periods of unattended data collection. Second, it must provide advanced scanning transmission electron microscopy capabilities for developing new 4D STEM imaging methods for biological specimens for thick biological specimens, where multiple electron scattering can limit conventional TEM imaging. This requires switching between stable, low-dose parallel-beam illumination for single-particle analysis and tomography, and focused-probe STEM acquisition with synchronized scanning and detection. These complementary capabilities must be available within the same cryogenic specimen environment to support the intended research and method development. The JEOL CRYOARM300S provides automated cryo-EM acquisition together with a dedicated STEM configuration and hardware for precise electron-dose management, enabling both established imaging workflows and advanced STEM experiments within one instrument.

2. **Integrated automated cryogenic specimen exchange**

The instrument must provide an integrated automated specimen exchange system capable of storing ten or more cryogenically preserved specimens and transferring them into the microscope without repeated manual handling. This requirement is essential for automated single-particle analysis and cryo-electron tomography, where large datasets must be collected from multiple specimens under cryogenic conditions. Automated specimen exchange allows users to organize measurements across multiple grids and return to previously screened specimens without contamination risk. As a shared research infrastructure serving users with different experience levels, it also enables routine unattended data acquisition alongside periods reserved for method development to reduce operator dependence and maximize instrument utilization. The JEOL CRYOARM300S incorporates an automated cryogenic specimen exchange system with storage for up to twelve specimens and automated transfer of multiple specimens between the storage system and microscope stage. Configurations relying on manually inserted cryogenic holders cannot provide equivalent unattended multi-specimen operation.

3. **Fast electrostatic beam blanking and dose control for STEM**

The proposed research requires precise control of electron exposure during STEM imaging of radiation-sensitive biological specimens for the development of low-dose 4D-STEM methods. The microscope must provide fast electrostatic beam blanking synchronized with STEM scanning and detection, as well as the capability for detector-responsive dose control. These functionalities are required to develop low-dose STEM and 4D-STEM methods for biological specimens, where unnecessary electron exposure must be minimized. The proposed JEOL CRYOARM300S configuration includes an Electrostatic Dose Modulator (EDM), providing fast beam blanking and programmable dose control, and compatibility with the IDES TEMPO-STEM system. TEMPO-STEM enables event-based blanking once a predefined number of electron detection events has been reached, which allows adapting exposure to the specimen signal. Together, these capabilities provide the required platform for developing advanced dose-efficient cryogenic STEM acquisition methods.

4. **Direct electron detection and integrated energy filtering**

The microscope must incorporate an energy filter and a direct electron detection camera and dedicated STEM detectors suitable for low-dose cryogenic imaging. Direct electron detection is essential for the intended single-particle and tomography applications because it enables efficient acquisition of weak electron signals at the limited electron doses tolerated by biological specimens. Energy filtering is equally important, particularly for imaging thicker biological samples with flood beam methods, where inelastic electron scattering increases the contribution of unwanted background signals. The dedicated STEM detectors are required for conventional STEM imaging, while compatibility with fast pixelated 4D-STEM cameras is essential for developing advanced imaging methods. The detector configuration must also support integration of the existing TVIPS XF416ES camera in our facility and compatibility with automated acquisition software for single-particle analysis and tomography. The JEOL CRYOARM300S incorporates an in-column Omega energy filter and can be configures with a direct electron detection cameras and dedicated STEM detectors. The proposed configuration includes these detectors and supports integration of 4D-STEM cameras and third-party acquisition software.

5. **Integrated operation and infrastructure efficiency**

The microscope must provide reliable integration of all required hardware and software, support unattended data acquisition and allow the development of new imaging methods without compromising routine cryo-EM operation. As a shared research infrastructure, it must also minimize maintenance-related downtime and provide supplier responsibility for the complete system. The JEOL CRYOARM300S combines automated specimen handling, improved fringe-free illumination, a cold field-emission electron source and an updated dry-vacuum pumping system. These features support acquisition efficiency and prolonged operation. The platform also supports community-developed acquisition software, providing flexibility for future method development. The complete configuration must be delivered within the approved project budget, including deinstallation and removal of the existing microscope, integration, installation, acceptance testing and maintenance support. Separate dedicated cryo-EM and STEM instruments would duplicate major infrastructure and would not fulfil the requirement for complementary measurements within the same specimen environment.

Assessment of reasonable alternatives

TU Delft has assessed alternative 300 kV electron microscope configurations against the above technical and operational requirements. Although individual capabilities are commercially available, the market consultation has not identified a reasonable alternative providing the complete combination of automated cryogenic specimen exchange, energy-filtered direct electron detection, advanced dose-controlled STEM and automated cryo-EM acquisition within one supported instrument and the available budget. In particular, configurations based on manually inserted cryogenic specimen holders cannot fulfil the essential requirement for unattended multi-specimen operation. The JEOL CRYOARM300S has been identified as meeting the combined requirements.

Conclusion

Based on the technical analysis and market investigation described above, TU Delft concludes that the required Cryo-TEM microscope can only be supplied by JEOL for technical reasons. No reasonable alternative or substitute has been identified and the absence of competition does not result from artificial narrowing of the procurement requirements. TU Delft therefore intends to apply the negotiated procedure without prior publication pursuant to Article 2.32(1)(b) of the Dutch Public Procurement Act 2012.

Decision

TU Delft has assessed whether there are suppliers on the market capable of meeting the specific technical, functional and integration requirements for the extension of the current infrastructure. Based on this assessment, TU Delft concludes that only JEOL has been identified as capable of delivering the required combination of technical, operational and integration requirements. TU Delft therefore intends to award a contract with JEOL. for the supply and implementation of a Cryo-(S)TEM microscope including DED camera and STEM detector.

Procedure

The contracting authority will observe a standstill period of at least 20 (twenty) calendar days starting from the date of publishing this announcement (from November 9th until November 28th 2026).

Any supplier who disagrees with this decision may appeal against it, via the electronic messaging system of TenderNed clarifying their objection, within the aforementioned period in preliminary relief proceedings. After 20 days, rights to object expire.

This is done by service of the summons on the contracting authority:

Delft University of Technology
Legal Services Department
Stevinweg 1, 5th floor
2628 CN Delft

In the interests of rapid and good progress, suppliers instituting preliminary relief proceedings are urged to inform the contact person of the contracting authority immediately by sending a copy of the summons via the messaging module of the Tenderned platform. The contracting authority will then communicate to the other suppliers via the Tenderned platform that preliminary relief proceedings have been instituted.

An application for joinder or intervention should be submitted to the competent court as soon as possible and in any event before the day on which the preliminary relief proceedings are heard. In principle, the contracting authority will await the decision in preliminary relief proceedings before proceeding with the final award.

If no economic operator initiates preliminary relief proceedings against this decision within the standstill period, the contracting authority will consider itself free to continue the negotiated procedure without prior publication with JEOL and, subject to successful completion of the negotiations, to enter into an agreement with JEOL.