

Annex No 1 to the tender documentation

PURCHASE CONTRACT

I. Contracting Parties

1. Institute of Scientific Instruments, CAS, v.v.i.

ID: 68081731
Tax ID: CZ68081731
Registered office: Královopolská 62/147, 612 64 Brno,
Represented by: Prof. Ing. Josef Lazar, Dr., Director
Person authorized to act in technical matters: Mgr. Tomáš Radlička, Ph.D.
(hereinafter referred to as the "Buyer")

2. NION CO.

ID: 601 831 271 (UBI Number)
Tax ID: 91-1856361
Registered office: 11511 NE 118th St., Kirkland, WA 98034 USA
represented by: Tracy Lovejoy, Chief Executive Officer
Person authorized to act in technical matters: Tracy Lovejoy, Chief Executive Officer
Bank account: Banner Bank
Account number: 4900577221
IBAN: not applicable in the US
SWIFT: BNNEUS66XXX
(hereinafter referred to as the "Seller")

II. Basic Provisions

1. This Contract is concluded pursuant to Section 2079 et seq. of Act No. 89/2012 Coll., the Civil Code, as amended (hereinafter referred to as the "Civil Code"); the rights and obligations of the parties not governed by this Contract shall be governed by the relevant provisions of Czech law, in particular the Civil Code.

2. The Contracting Parties declare that the information given in Article I of this Contract corresponds to the facts at the time of conclusion of the Contract. The Contracting Parties undertake to notify the other Party in writing without delay of any changes to the data concerned. No amendment to the Contract shall be necessary if the identification and contact details of the parties are changed, including a change of account.
3. If the Seller is a VAT payer, it declares that the bank account referred to in Article I, paragraph 2 of this Contract is a bank account published in accordance with Act No. 235/2004 Coll., on Value Added Tax, as amended (hereinafter referred to as the "VAT Act"). In the event of a change in the Seller's account, the Seller shall be obliged to prove ownership of the new account by a copy of the relevant contract or a certificate from a money institution; if the Seller is a VAT payer, the new account shall be a public account within the meaning of the preceding sentence.
4. The Parties declare that the persons signing this Contract are authorized to do so.
5. The Seller declares that it is professionally qualified to provide the subject of performance under this Contract.

III. Subject matter of the Contract

1. The Seller undertakes to deliver to the Buyer the goods referred to in paragraph 2 of this Article of the Contract, including all components, their installation (or other commissioning), the delivery of the relevant manuals (hereinafter "the Goods"). The Seller further undertakes to allow the Buyer to acquire ownership of the goods. The Buyer undertakes to take delivery of the goods and to pay the Seller the purchase price for them in accordance with Article IV of this Contract. The Goods are being purchased by the Buyer under the public contract entitled "**UPT-VZ-22-04: Skenovací transmisní elektronový mikroskop s atomárním rozlišením**".
2. A more detailed specification of the goods is set out in Annex 1 to this Contract. The goods supplied must be new and unused.
3. Installation, testing of the functionality of the goods and familiarization with the use of the goods must be carried out within the time limit set out in Article V of this Contract.
4. The Seller undertakes to train the users on the ability to operate the goods (software and hardware) upon installation of the goods. The training of users will take place during installation so that trained users can continue to train new users, even during the warranty period, without the Buyer losing warranty rights.
5. The Seller undertakes to demonstrate the fulfillment of selected parameters and requirements specified in Annex 1 to this contract during the installation of the goods (marked in red colour in Annex 1). The fulfillment of the selected parameters will be recorded in the handover protocol.
6. The Seller acknowledges that it is a person obliged to cooperate in the performance of

financial control pursuant to Section 2(e) of Act No. 320/2001 Coll., on financial control in public administration, as amended. The Seller also undertakes to allow all entities authorized to carry out controls, from whose funds the delivery is paid, to inspect documents related to the performance of the Contract, for the period of time specified by the Czech legislation for their archiving (Act No. 563/1991 Coll., on Accounting, as amended, and Act No. 235/2004 Coll., on Value Added Tax, as amended).

IV. Purchase price

1. The purchase price is the

price excluding VAT (CZK)	56 860 000 CZK
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2. The purchase price according to paragraph 1 of this Article of the Contract includes all costs of the Seller related to the fulfillment of its obligations under this Contract, i.e. the price of the goods including transport and transport insurance, possible customs fees¹, documentation, installation of the goods, familiarization with the operation of the goods, provision of warranty service and other related costs. The purchase price is set as a maximum and may not be exceeded.
3. If the Seller is a VAT payer, the Seller is responsible for ensuring that the VAT rate is set in accordance with the applicable and effective legislation; in the event of a change in the statutory VAT rate, the Seller will be obliged to charge VAT at the applicable rate to the purchase price exclusive of VAT. The Contracting Parties agree that in the event of a change in the purchase price due to a change in the VAT rate, it is not necessary to conclude an addendum to the Contract. In the event that the Seller sets the VAT rate or the VAT rate in violation of the applicable legislation, the Seller shall be obliged to pay the Buyer for any damage incurred in connection therewith.

V. Place and term of performance

1. The Seller is obliged to deliver the goods at the place of performance, which is the Buyer's registered office - i.e. at Královopolská 62/147, 612 64 Brno.
2. The Seller undertakes to hand over the goods to the Buyer and to carry out further performance for the proper commissioning of the goods and the possibility of their proper use to the Buyer no later than 30. 11. 2024, provided that the Contract comes into force by 31. 12. 2022.

¹ The buyer draws attention to the fact that the established customs rate (for trading from third countries) for goods with the Combined Nomenclature (CN) code according to the EU Common Customs Tariff 9012 10 10 (Electron microscopes equipped with equipment specially designed for the handling and transport of semiconductor wafers or focal wafers) is 0 %.

VI. Obligations of the Seller and the Buyer

1. The Seller shall:
 - a) Deliver the goods properly and on time.
 - b) Deliver the goods new, unused and in compliance with the applicable technical standards, legal regulations and manufacturer's regulations, as well as the requirements set out in the Contract.
 - c) Upon delivery of the goods to the place of performance according to Article V of this Contract, to hand over to the Buyer the documents related to the goods (instructions for use, etc.) in Czech or English.
 - d) Provide all necessary documents in Czech or English that are required for the proper use of the goods. Such documents mean in particular all documentation, certificates, attestations or other legal acts that are necessary for approval for the operation and subsequent use of the goods in the Czech Republic.
 - e) The documents referred to in point d) of this Article of the Contract shall be handed over by the Seller at the place of performance together with the goods.
 - f) To grant the Buyer the right to exercise the right to use the software included in the delivery of the goods (license) for the needs of the Buyer or users in accordance with the purpose of the purchase of the goods. The software license is granted by the Seller to the Buyer within the meaning of Section 2358 et seq. of the Civil Code. The remuneration for granting the license is part of the purchase price as agreed in Article IV of this Contract. Liability for unauthorized interference with copyright and other rights of third parties shall be borne solely by the Seller, unless the Buyer is proven to be at fault.
 - g) Inform the Buyer in writing of any facts affecting the performance of the Contract without undue delay, but no later than 10 working days after the relevant fact occurs or the Seller becomes aware that it may occur.
 - h) At the Buyer's invitation, attend all meetings (in person/video-conference) relating to the delivery of the goods or, at the Buyer's written request, provide a report on the status of the preparation of the delivery of the goods or the required documentation on the preparatory work.
2. In addition to the Buyer's obligations set forth in other parts of this Contract, the Buyer shall:
 - a) Provide the Seller with the necessary cooperation in the performance of its obligation.
 - b) If the goods offered are free from obvious defects and the Seller's performance meets the requirements set out in this Contract, to accept the goods.

VII. Handover and acceptance of goods

1. The goods shall be handed over and taken over at the place of performance in accordance with Article V(1) of this Contract. The goods shall be deemed to have been taken over after they have been handed over, after the goods have been installed, after the Buyer's representatives have familiarized themselves with the operation of the goods and have handed over all the documents specified in this Contract (in particular as per Article VI(1)(d) of the Contract) and after the handover protocol has been signed by both Contracting Parties.
2. The Buyer shall be entitled to inspect the goods at the place of their production before handover and acceptance of the goods. The contractual parties shall agree on the inspection date.
3. The Buyer shall inspect the goods upon receipt:
 - a) the apparent quality characteristics of the goods,
 - b) that the goods have not been damaged in transit,
 - c) fulfillment of the selected parameters in the sense of Article III paragraph 5 of the contract, according to Annex No. 1 to the contract,
 - d) the documents supplied with the goods (manuals, warranty certificates, etc.).
4. The result of the inspection upon receipt of the goods is the following 3 statuses:
 - a) **Accepted**; in the event that the buyer does not discover defects during the inspection of the goods (including the fulfillment of the selected parameters in the sense of Article III paragraph 5 of the contract).
 - b) **Accepted with reservations**; in the event that the buyer discovers defects during the inspection of the goods that do not affect the functionality of the subject of performance; in such a case, the procedure will be the same as if it were minor defects that arose during the warranty period in the sense of Article X paragraph 6 of the contract.
 - c) **Not accepted**; in the event that, during the inspection of the goods, the buyer discovers defects that prevent the functionality of the goods in relation to the intended methods of use (see e.g. Annex No. 1 to the contract); in such a case, the seller will be given a reasonable period for the removal of defects; if the defects are removed within a reasonable period of time, it will be added to the handover protocol that the goods have been accepted or have been accepted with reservations.
5. The Seller shall draw up a handover protocol (hereinafter referred to as the "the handover protocol") on the handover and acceptance of the goods.
6. The handover protocol shall be drawn up in two copies, one copy for the Buyer and one copy for the Seller. The handover protocol shall be signed on behalf of the Buyer by the person authorized to act in technical matters.

7. The handover protocol must contain
- a) the number and date of the handover protocol,
 - b) the designation of the subject-matter of the Contract,
 - c) the identification of the Buyer and the Seller,
 - d) the number of this Contract assigned by the Buyer and the date of its execution, including the numbers and dates of any amendments thereto,
 - e) the place of performance according to Article V paragraph 1 of this Contract,
 - f) the name and type of goods as set out in Annex 1 to this Contract,
 - g) the date and place of delivery of the goods,
 - h) description of possible defects and deficiencies,
 - i) the resulting status of the inspection in the sense of Article VII paragraph 4 of the contract;
 - j) the names and signatures of the Seller's and Buyer's representatives authorized to act in technical matters pursuant to Article I of this Contract or other authorized persons.
8. The Seller is responsible for the fact that the information given in the delivery note corresponds to the reality. If the delivery note does not contain the information referred to in paragraph 7 of this Article of the Contract, the Buyer is entitled to refuse to accept the goods until the delivery note containing the above-mentioned information has been handed over.
9. The Buyer shall have the right to refuse to accept such goods which are manifestly defective or delivered in breach of the terms of this Contract. The Buyer shall also have the right to refuse to accept the goods in the event that the Seller fails to allow the Buyer to properly inspect and examine the goods delivered. The Buyer shall confirm the refusal to accept the goods and the reasons for it on the delivery note.
10. The Seller shall deliver the Goods and install them, unless otherwise agreed between the Contracting Parties, during the Buyer's normal business hours so as to limit or interrupt operations only to the extent necessary. The Seller shall be fully liable for any damage to the Buyer's property caused by its activities related to the delivery and installation of the goods. The Seller shall also comply with all occupational health and safety regulations when installing the goods. The Buyer shall provide the Seller with the necessary assistance for the installation of the Goods.

VIII. Transfer of title and transfer of risk of damage to goods

1. The Buyer acquires ownership of the goods upon proper acceptance of the goods in accordance with Article VII of the Contract, i.e. after mutual agreement of the transfer

protocol with the status "accepted" or "accepted with reservations"; at the same time the risk of damage to the Goods passes to the Buyer.

IX. Payment terms

1. Payment of the purchase price will be made according to the following mechanism:
 - i. 40 % of the purchase price without VAT will be paid by the Buyer as an advance payment by 31. 12. 2022,
 - ii. 40 % of the purchase price without VAT will be paid by the Buyer as an advance payment by 31. 12. 2023,
 - iii. 50 % of the remaining part of the purchase price without VAT will be paid by the Buyer as an advance payment after inspection of the goods at the place of its production, should it be executed,
 - iv. the remaining part of the purchase price without VAT will be paid by the Buyer after proper handover and acceptance of the goods according to Article VII of the Contract, i.e., after mutual agreement of the transfer protocol with the status "accepted" or "accepted with reservations".

VAT will be added to the purchase price according to the relevant legal regulations.

2. If the Seller is a VAT payer, the basis for payment of the part of the purchase price according to Article IX, paragraph 1 point 1.iv of the Contract will be an invoice, which will have the formalities of a tax document according to the VAT Act and the formalities stipulated by other generally binding legal regulations. If the Seller is not a VAT payer (*or is a foreign person who is not obliged to charge VAT in the Czech Republic on the basis of generally binding legal regulations*), the basis for payment of part of the purchase price under Article IX, paragraph 1 point 1.iv of the Contract will be an invoice that will have the formalities specified by generally binding legal regulations. The invoice must also contain:
 - a) the Buyer's contract number, the Buyer's identification number, the public contract number,
 - b) invoice number and date of issue,
 - c) the subject of the performance and its exact specification in words (a reference to the number of the concluded Contract is not sufficient),
 - d) the bank and account number to which payment must be made (if the account number is different from that referred to in Article I(2), the Seller shall inform the Buyer of this fact in accordance with Article II(2) and (3) of this Contract),
 - e) the due date of the invoice,
 - f) the name and signature of the person who issued the invoice, including a contact telephone number,

- g) the number of the delivery note and the date of signature. The delivery note will be attached to the invoice,
(hereinafter referred to as the "final invoice").

The aforementioned obligation applies similarly to the seller who is not a VAT payer.

3. The Seller shall be entitled to issue the final invoice according to the preceding paragraph of the Contract at the earliest after the goods have been duly accepted by the Buyer, i.e., after mutual agreement of the handover protocol with the status "accepted" or "accepted with reservations".
4. For the purposes of payment of the purchase price under paragraph IX(1.i) and 1.ii), the Seller shall issue an advance invoice for the relevant amount no later than 30 calendar days before the deadline under paragraph IX(1.i) and 1.ii).
5. For the purposes of payment of the purchase price under paragraph IX(1.iii), the Seller shall issue an advance invoice for the relevant amount within 10 calendar days at the latest from the moment of inspection of the goods at the place of its production.
6. The Seller shall account for all advance payments to the Buyer in the final invoice.
7. The due date for any invoice shall be 30 calendar days from the date of delivery to the Buyer.
8. The obligation to pay the purchase price is fulfilled on the date the relevant amount is debited from the Buyer's account.
9. If the invoice does not contain any mandatory or agreed particulars or if the price or -VAT is incorrectly charged, the Buyer is entitled to return the invoice to the other Contracting Party for correction before the due date, indicating the reason for the return. The Seller will make the repair by issuing a new invoice. The return of the defective invoice to the Seller shall terminate the original due date. The new due date starts from the date of delivery of the new invoice to the Buyer.
10. If the Seller is a VAT payer, the Buyer shall apply the institute of a special method of securing the tax according to Section 109a of the VAT Act and shall pay the value of the performance corresponding to the value added tax stated on the invoice within the due date of this invoice determined according to the contract directly to the Seller's personal deposit account kept with the locally competent tax administrator in the event that
 - a) the Seller will be published as an unreliable payer in the "Register of VAT payers" on the date of the taxable supply, or
 - b) the Seller will be in insolvency proceedings on the date of the taxable supply, or
 - c) the bank account of the Seller intended for payment of the performance indicated on the invoice will not be published by the tax administrator in the "VAT register".

This payment will be considered as the fulfillment of the part of the obligation corresponding to the relevant VAT amount agreed as part of the contractual price for the

performance in question. The Buyer shall not be liable for any penalties and other sanctions assessed or determined by the tax administrator to the Seller in connection with the potentially late payment of VAT, i.e. after the due date of this tax.

X. Quality guarantee, rights from defective performance

Quality guarantee

1. The Seller shall provide the Buyer with a warranty for the quality of the goods (hereinafter referred to as "guarantee") within the meaning of Section 2113 et seq. of the Civil Code for a minimum period of 36 months (hereinafter referred to as "guarantee period"). The warranty period also covers the lifetime of all components of the goods. The Seller also undertakes to guarantee the availability of post-warranty service of the delivered goods for at least 7 years after the end of the warranty period in case the Buyer requests it before the end of the warranty period using the contact details in paragraph 5 of this article of the Contract.
2. The warranty period shall commence on the date of acceptance of the goods by the Buyer, i.e. today the delivery note is signed by both Contracting Parties. The warranty period is built up for the period during which the Buyer cannot use the goods properly due to defects for which the Seller is responsible.
3. For reporting and rectification of defects under the warranty, the conditions set out in paragraph 7 et seq. of this Article of the Contract shall apply.
4. The Seller declares that the warranty extends to any subsequent owner of the goods, in full, until the end of the warranty period.
5. Any defects of the goods that become apparent during the warranty period, the Buyer is obliged to apply to the Seller without undue delay after the defect has been discovered, in the form of a written notification containing the most detailed specification of the defect found. The Buyer is entitled to notify defects in the goods in one of the following ways:

e-mail:

- e-mail: info@nion.com, lovejoy@nion.com
- phone: **+1 (425) 576-9060**
- Mailing address: **1151 NE 118th St., Kirkland, WA 98034 USA**

This does not apply if the defect in the goods was caused by the Buyer acting intentionally or grossly negligently.

6. The Buyer has the right to have the defect rectified by the delivery of new goods or free repair; if the defect in the goods constitutes a material breach of contract (see, mutatis mutandis, Sections 2106 and 2002 of the Civil Code), he also has the right to withdraw from the Contract. The Buyer has the right to choose the performance.

7. After reporting a defect according to paragraph 5 of this article of the Contract, the Seller is obliged to ensure the arrival of a professional service technician within 10 working days unless the Contracting Parties agree otherwise. Service for the purpose of removing defects will take place at the place of installation of the goods. In the case of replacement or repair of the goods at the Seller's service center or an authorized service center of the manufacturer of the goods, the Seller shall ensure free of charge transport of the defective goods from the Buyer to the service center and transport of the repaired or replaced goods back to the Buyer.
8. The rectification of the defect must be carried out (including the delivery of the repaired or replaced goods to the Buyer) no later than 30 days from the notification of the defect to the Seller pursuant to paragraph 7 of this Article of the Contract, unless the Contracting Parties agree otherwise in writing in a particular case.
9. The Seller shall draw up a record of the progress of the repair, removal of the defect or replacement of the goods and related matters, which shall be confirmed by both Contracting Parties, with at least the following data: the designation of the defective goods, description of the defect, the progress of the method of removal of the defect, the date of notification of the defect and the date of removal.
10. In the event of replacement of the defective goods or part thereof, a new warranty period of the duration of paragraph 1 of this Article of the Contract shall commence for the replaced goods or part thereof.
11. The Seller is obliged to reimburse the Buyer for the damage caused by the defective performance. The Seller shall also reimburse the Buyer for the costs incurred in exercising the rights arising from the defective performance.

Change in the quality guarantee

12. In the event of the Seller's delay in delivering the goods within the deadline according to Article V, paragraph 2, the warranty period is extended by two months for each commenced month of delay with the delivery of the goods.
13. If a defect appears in the goods during the warranty period and, as a result, the goods will not be functional for longer than 10 days in a calendar month, the warranty period is extended by one month.
14. In the event of the Buyer's delay in payment of the purchase price according to Article IX within the term according to this Article of the Contract or within the term according to the issued invoice, the warranty period is shortened by one month for each commenced month of delay in payment of the purchase price in accordance with Article IX.

XI. Damages

1. The maximum amount of damages is limited to 50 % of the total price excluding VAT according to Article IV of the Contract.
2. The Contracting Parties have agreed that the obligation to compensate for damages in connection with this Contract applies only to so-called direct damages, i.e. damages incurred by a party as a result of the other Contracting party's breach of its contractual obligation. There must be a causal link between the breach of the contractual obligation and the damage suffered by the other Contracting Party. Direct damages do not include lost profits.

XII. Force majeure

1. If circumstances arise during the duration of the contractual relationship:
 - a. that objectively prevent the delivery of the goods by the agreed date or the fulfillment of other contractual obligations of both Contracting parties,
 - b. that occurred independently of the will of the obligated Contracting party,
 - c. that the obliged Contracting party could not foresee,
 - d. for which it cannot reasonably be assumed that it will be overcome or averted by the obligated contracting party,

(hereinafter referred to as "*force majeure*"),

the deadline for fulfilling the obligation in question is automatically extended by the period during which the circumstances according to this paragraph demonstrably prevented the fulfillment of the obligation.

2. The obligated Contracting party has the obligation to inform the other Contracting Party of the existence of force majeure without unnecessary delay.

XIII. Termination of the Contract

1. This Contract shall terminate:
 - a) by written agreement of the Contracting Parties,
 - b) by unilateral withdrawal from the Contract for material breach of the Contract by the other Contracting Party, provided that material breach of the Contract means in particular
 - failure to hand over the goods to the Buyer within the specified period of performance extended by 30 days,
 - if the goods have defects which render them unusable or do not have the characteristics which the Buyer has stipulated or which the Seller has assured him of,

- failure to provide information within the meaning of Article VI(1)(h) of the Contract,
 - non-payment of the purchase price by the Buyer after a second demand by the Seller for payment of the amount due, where the second demand may not follow earlier than 30 days after the delivery of the first demand.
2. The Buyer is further entitled to withdraw from this Contract in the following cases:
 - a) if- the competent court has decided that the Seller is bankrupt within the meaning of Act No. 182/2006 Coll., on bankruptcy and methods of its resolution (Insolvency Act), as amended (regardless of the legal force of this decision);
 - b) if the Seller files an insolvency petition against himself.
 3. Withdrawal from the Contract does not affect the right of the entitled party to pay a contractual penalty or compensation for damages resulting from the breach of contract.
 4. For the purposes of this Contract, the term "without undue delay" according to Section 2002 of the Civil Code means "within 3 weeks at the latest".

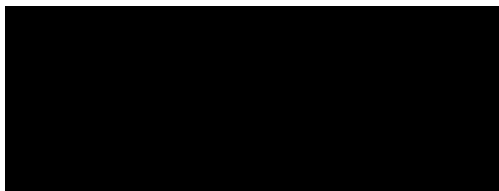
XIV. Final provisions

1. This Contract shall enter into force on the date of its signing by both Contracting Parties and shall become effective on the date of its publication in the Register of Contracts pursuant to Act No. 340/2015 Coll., on Special Conditions for the Effectiveness of Certain Contracts, Publication of Such Contracts and on the Register of Contracts (Act on the Register of Contracts), as amended. Publication in the Register of Contracts shall be made by the Buyer and the Seller shall be informed of this fact within 5 calendar days of publication.
2. This Contract may be amended or modified only with the consent of both Contracting Parties, and only by means of written, consecutively numbered and so marked amendments.
3. The Seller may not assign its rights and obligations under this contract to a third party without the consent of the Buyer.
4. All disputes arising from this contract must be resolved by mutual agreement; if this procedure is not possible, the Municipal Court in Brno is competent (in the first instance) to resolve disputes arising from this contract.
5. Shall this Contract be made out in both Czech and English version, the Czech version shall prevail in case of any ambiguity.
6. The Contracting Parties to the Contract declare that they have read the contract before signing it, that it has been concluded according to their true and free will, definitely, seriously and intelligibly, and that they have agreed on its entire content, which they confirm by their signatures.
7. The following annexes form an integral part of this Contract:

Annex 1: Specification of the subject of the public contract

In Brno on 11.11.2022

At Kirkland on November 11, 2022



on behalf of the Buyer

Prof. Ing. Josef Lazar, Dr., Director



Annex No. 1 - Specification of the subject matter of the public contract

Subject-matter of the public procurement "UPT-VZ-22-04: Skenovací transmisní elektronový mikroskop s atomárním rozlišením"

Subject-matter of the public procurement:

The subject-matter of the public procurement is the delivery, the installation and the installation of the high-resolution scanning transmission electron microscope with atomic resolution (hereinafter referred to as 'HR STEM').

HR STEM is a microscope for studying the structure and properties of conductive and non-conductive thin samples with high spatial resolution. It operates primarily in the scanning mode, at higher energies than standard scanning electron microscopes (SEMs). The magnetic objective lens has a closed construction that allows the magnetic field to be confined only to a close proximity of the sample, which significantly improves the optical properties of the system. If the system is additionally equipped with the cold-field emission electron gun and a spherical aberration corrector, it is possible to achieve the atomic resolution at beam energies as low as 30 keV. Compared to the standard SEM, the HR STEM is also equipped with additional optics under the sample. It enables further processing of the transmitted electron beam in order to obtain precise angular distribution of the transmitted electrons, which can be used in quantitative imaging and diffractive techniques.

Future use:

HR STEM will be used to analyze a wide range of samples, such as biological samples that will be observed at the liquid nitrogen temperature. It will be also used to study samples very sensitive to contamination. These require an ultra-high vacuum to prevent deposition of carbon contamination layers. Primarily, we will study the defects in advanced 2D and 3D nanostructures and the structure and nano-precipitates in steels, where the minimal contamination at pressures below 5×10^{-9} torr makes it possible to analyze the properties of surface layers, such as passivation layers on the surface of metal alloys. Atomic resolution at energies below 100 keV is also required to study these samples.

Contracting authority intends to utilize standard microscopic methods for sample analysis: a) the bright-field and dark-field modes, using standard annular detectors ADF, MAADF, and HAADF b) electron diffraction using a high-resolution high-speed Ronchigram camera. The microscope will also be equipped with technologies for the analysis and development of non-standard, albeit scientifically interesting microscopic methods. In particular, that will include

- a) The detection of secondary electrons (SE) with atomic resolution, which will provide for indispensable additional analytical data (topography, morphology, location, ...), and thus enable an advanced interpretation of HAADF images.
- b) 4D STEM and ptychography, for which the microscope will be equipped with a fast direct pixelated detector. These techniques make it possible to reconstruct the

amplitude and phase of the potential interaction function of the sample, which allows even light atoms (low atomic number) to be observed simultaneously with heavier atoms (high atomic number).

- c) Quantitative STEM imaging, where very sensitive BF and ADF detectors with detailed information on detection angles and properties are important, including the possibility of a continuous change in the detection angles. For the development of electron microscopic methods, we require access to the alignment procedures of the microscope software and open-source access to the data acquisition and processing code.

Compatibility requirements:

Although our current budgetary resources for an HR STEM cannot accommodate an EDS detector, an EDS detector, an energy monochromator, and a detector for EELS, it is essential for the contracting authority that the microscope will be compatible with these technologies and will allow for expansion with these techniques/technologies later.