APPENDIX 1 SAMPLE SETTINGS FOR THE ACCELERATOR

Below are some sample settings for 500 KeV $^4$He$^+$, 2.00 MeV $^4$He$^+$, and 1.50 MeV $^{16}$O$^{+2}$. Generally the Einzel lens is at the maximum setting possible without arcing (25 KV), and the steerer magnets are at 374 V, 0 V, 830 V, 0 V.

500 KeV $^4$He$^+$

These settings yielded 1 nA on a sample in the MEIS chamber with three shorting bands.

Oven Heat: 64.2% 238°C
Chamber: 68°C
Gas #1: 59.2%
Gas #2: 20.6%
Probe {Srce} 5.3 KV 5.0 KV 1.90 mA
Magnet I 4.00 A
Extract V 6.0 KV
Source Bias 15.7 KV 14.9 KV
Focus 2.1 KV 1.9 KV
Vel Sel 1.272 KV
Y Steerer -392
Einzel Lens 6.1 KV 5.8 KV
X Quad 6.74 A
Y Quad 7.02 A
Switcher Mag 10.35 A
TermGasStrp 30.0%
LE IGC 3.3E-06 T
HE IGC 3.6E-06 T
FC LE OUT
Charging PS 12.8
TRV/GVM 0.243 MV 0.243 MV
TPS Mode C/R GVM GVM
Probe [Term] 64.5% 64.4%
Probe [Term] 8.7 µA
Bias Current 23 µA
Grid 18.2 V
Control Gain 50.1%
CPO Gain 50.0%
Chain & charging PS 15.8 µA
ColmCurLe,HE 1.5 µA 0.0 µA
### $^{2.009\text{ MeV}}{}^{4}\text{He}^+$

These settings yield 3.8 nA on a sample in the MEIS chamber with one shorting band.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven Heat</td>
<td>63.7%</td>
<td>235°C</td>
</tr>
<tr>
<td>Chamber</td>
<td></td>
<td>67°C</td>
</tr>
<tr>
<td>Gas #1</td>
<td>59.2%</td>
<td></td>
</tr>
<tr>
<td>Gas #2</td>
<td>20.6%</td>
<td></td>
</tr>
<tr>
<td>Probe {Srce}</td>
<td>5.4 KV</td>
<td>5.1 KV</td>
</tr>
<tr>
<td>Magnet I</td>
<td>4.00 A</td>
<td></td>
</tr>
<tr>
<td>Extract V</td>
<td>5.8 KV</td>
<td></td>
</tr>
<tr>
<td>Source Bias</td>
<td>15.7 KV</td>
<td>14.9 KV</td>
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<tr>
<td>Focus</td>
<td>1.2 KV</td>
<td>1.1 KV</td>
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<tr>
<td>Vel Sel</td>
<td>1.279 KV</td>
<td></td>
</tr>
<tr>
<td>Y Steerer</td>
<td>-224</td>
<td></td>
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<tr>
<td>Einzel Lens</td>
<td>17.8 KV</td>
<td>16.9KV</td>
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<tr>
<td>X Quad</td>
<td>12.79 A</td>
<td></td>
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<tr>
<td>Y Quad</td>
<td>10.01A</td>
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<tr>
<td>Switcher Mag</td>
<td>20.86 A</td>
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<tr>
<td>TermGasStrp</td>
<td>29.9%</td>
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<tr>
<td>LE IGC</td>
<td>2.9E-06 T</td>
<td></td>
</tr>
<tr>
<td>HE IGC</td>
<td>4.3E-06 T</td>
<td></td>
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<tr>
<td>FC LE</td>
<td>OUT</td>
<td></td>
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</table>
Charging PS 17.2

TRV/GVM  0.999 MV  0.997 MV

TPS Mode C/R  GVM  GVM

Probe [Term]  17.5%  17.5%

Probe [Term]  9.5 µA

Bias Current  10 µA

Grid  5.6 V

Control Gain  11.3%

CPO Gain  50.0%

Chain & charging PS  21.4 µA

ColmCurLe,HE  5.2 µA  0.0 µA
1.5 MeV $^{16}\text{O}^{2+}$

These settings yield 41 nA on the MEIS midline Faraday cup with two shorting bands.

- Oven Heat: 66.4% 306°C
- Chamber: 96°C
- Gas #1: 61.8%
- Gas #2: 28.4%
- Probe (Srce) 5.5 KV 5.1 KV 2.07 mA
- Magnet I: 4.00 A
- Extract V: 5.5 KV
- Source Bias: 14.3 KV 13.6 KV
- Focus: 1.7 KV 1.6 KV
- Vel Sel: 0.602 KV
- Y Steerer: -457
- Einzel Lens: 15.8 KV 15.0 KV
- X Quad: 9.67 A
- Y Quad: 10.07 A
- Switcher Mag: 17.56 A
- TermGasStrp: 28.5%
- LE IGC: 4.6E-06 T
- HE IGC: 3.1E-06 T
- FC LE: OUT
<table>
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<th>Parameter</th>
<th>Value</th>
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<tr>
<td>Charging PS</td>
<td>16.3</td>
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<tr>
<td>TRV/GVM</td>
<td>0.490 MV, 0.486 MV</td>
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<tr>
<td>TPS Mode C/R</td>
<td>GVM, GVM</td>
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<tr>
<td>Probe [Term]</td>
<td>29.6%, 29.6%</td>
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<tr>
<td>Probe [Term]</td>
<td>15.6 µA</td>
</tr>
<tr>
<td>Bias Current</td>
<td>35 µA</td>
</tr>
<tr>
<td>Grid</td>
<td>2.8 V</td>
</tr>
<tr>
<td>Control Gain</td>
<td>24.7%</td>
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<tr>
<td>CPO Gain</td>
<td>47.6%</td>
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<tr>
<td>Chain &amp; charging PS</td>
<td>17.6 µA</td>
</tr>
<tr>
<td>ColmCurLe,HE</td>
<td>2.9 µA, 0.0 µA</td>
</tr>
</tbody>
</table>
INDEX 1

Absolute coverage, i, xi, 2, 6, 26, 67, 74, 97, 100
Abukawa and Kono Model, 23, 24, 25, 45, 114, 125
Adatoms, 32, 33, 35, 116
Alkali Metals, 2, 24
Angle Resolved Photoemission Spectroscopy, 18
Antimony, 77
ARUPS, 23, 27, 121
Auger Electron Spectroscopy, 49, 56, 57, 60, 61, 62, 65, 67, 79, 82, 83, 84, 85, 89, 90, 91, 94, 113
Binding Sites
  Bridge, 21, 23
  Cave, 21, 22
  Pedestal, 21, 22, 23
  T1, 21
  T2, 21, 22
  T3, 22
  Valley, 21, 22
Bøgh, 50, 79
Bridge Site, 21
Buckled, 18, 20
Bulk, 3, 4, 11, 13, 15, 16, 17, 19, 24, 30, 32, 33, 37, 54, 55
Carbon, 79, 84, 85
Cave Site, 21
Centered, 13, 18, 72
Chadi, 18, 44
Chao, 23, 24, 45, 125
Charge exchange, 69
Contaminants, 26, 49, 83, 84, 89, 97
Correction, 73, 74, 97
Correction Factor, 73, 74, 97
Coverage, 2, 6, 13, 21, 23, 24, 25, 26, 34, 36, 37, 54, 61, 67, 73, 75, 76, 78, 84, 97, 100, 104, 114
Cross section, 6, 22, 51, 52, 54, 75
Cs/Si(100)-2x1, xi, 2, 21, 23, 24, 25, 26, 89, 95, 96, 97
Cs/Si(100)2x1, xi, 2, 21, 23, 24, 25, 26, 89, 95, 96, 97
Cs/Si(111)-7x7, xi, 27, 34, 37, 90, 98, 99, 100
Cs/Si(111)7x7, xi, 37, 90, 98, 99, 100
Current integration, 51, 56, 63, 64, 66, 68, 72, 73, 76, 100, 127, 129, 131
desorption, xi, 7, 8, 23, 24, 106, 107, 109, 110, 111, 112, 114, 115, 118, 119, 124
Dimer, 17, 18, 20, 21, 30, 31, 32, 115
Dimer Adatom Stacking Fault Model, 31, 32
Dipole, 2, 22
Doped, 77
Dosing, 22, 24, 36, 57, 62, 66, 67, 98
EELS, 41, 121, 122
Einzel, 126, 128, 130
Einzel Lens, 126, 128, 130
Electron, 18, 22, 60, 62, 79, 113
electron localization, xi, 121
Electrons, 2, 4, 18, 22, 23, 31, 37, 45, 51, 52, 54, 56, 60, 61, 62, 69, 71, 72, 73, 76, 79, 84, 113
Enta, 23, 45
Errors, 67, 73, 74, 76, 100
FCC Crystal Structure, 13, 14
Field Ion Scanning Tunneling Microscopy, 35
Flashing, 59, 64, 65, 66
Goldstein, 9, 22, 45
Hamamatsu, 23, 24, 45
Hydrogen, 26
Ion Gauge, 58
Ion scattering, 30, 46, 50, 72
Kennou, 23, 45, 125
Landemark, 20, 45
Laser, 59, 60, 76
Levine, 22, 23, 24, 25, 45, 114, 125
Load-lock, 58
Low Energy Electron Diffraction, 18, 20, 22, 23, 27, 33, 34, 36, 45, 57, 58, 62, 65, 67
Magnusson, 9, 35, 36, 47, 116, 125
Mangat, 23, 45
Medium Energy Ion Scattering, 26, 69, 70, 71, 72, 126, 128, 130
Metallization, 2, 37
Meyerheim, 115, 125
monolayer, 23, 24, 25, 36, 114
Moore, 75, 80, 95, 98, 113
multilayer, 1, 121, 122
Nastasi, 9, 52, 76, 79
Negative Electron Affinity State, 3, 22
Nuclei, 52, 53, 54, 55, 75
Oxygen, 3, 22, 79, 84, 85, 89
Pelletron, 68
Potassium, 24
Resistor, 63
Rest Atoms, 32, 35
RUMP, 52, 73, 74, 75, 76, 77, 79, 95, 97, 98, 99, 102, 103, 113
Rutherford, 2, 6, 26, 51, 52, 54, 67, 72, 75
  Backscattering Spectrometry, 2, 6, 50, 67
  Backscattering Spectrometry, 2, 6, 26, 37, 49, 57, 58, 67, 72, 77, 79, 95, 96, 98, 99,
      100, 102, 103, 113
  formula, 51, 52, 54, 75
Rutherford Backscattering Spectrometry, 2, 6, 67
saturated, vi, viii, ix, 4, 5, 11, 23, 42, 89, 93, 97, 122, 123
Saturation, 2, 6, 22, 24, 34, 36, 37, 67, 89, 90, 91, 95, 96, 97, 98, 99, 100, 102, 103, 114,
      115
Scanning Tunneling Microscopy, 20, 23, 26, 27, 30, 31
Schottky Barriers, 4
Semiconductors, xi, 1, 4, 23, 37
Shkrebtii, 20, 44
Shorting bands, 126, 130
Simulations, 20, 73, 74, 75, 76, 77, 79, 95, 97, 98, 99, 100, 103, 113
Soukiassian, 9, 45, 46, 97, 113
Straggling, 76
Switches, 30
Symmetries, 18, 20, 22, 34
Tandem Van de Graaff accelerator, 51, 68, 69, 70
Tesmer, 9, 52, 76, 79
Thermal Desorption Spectroscopy, 23, 24, 27
Transfer Rod, 58
Turbo Molecular Pump, 58, 71
Turbovac, 58
ultrathin, 1, 68, 121
Uncertainty, 74, 77, 97, 100, 104
Valley Site, 21, 22
Varian, 80
Wafers, 56, 63, 77, 79
Weighting, 97, 100
Work Function, 3, 22
XPD, 23, 27
Xu, 9, 23, 26, 45
Name: Rajarshi Banerjee
Nationality: Indian
Date of Birth: November 16, 1968.
Place of Birth: Kanpur., U.P., India

Education: Master’s Degree in Computer Sciences
Drexel University
Department of Math and Computer Sciences.
Philadelphia, PA, USA (1996-98)

Master of Technology in Physics and Atmospheric Sciences.
Indian Institute of Technology
Department of Physics

Master of Science in Physics
Indian Institute of Technology
Department of Physics
Mumbai, India (1989-91).

Bachelor of Science in Physics, Hons.
University of Mumbai, R. N. Ruia College
Mumbai, India (1986-89).

Work Experience: Modeler / Software Engineer
Strategic Management Group Inc.

Publications:
