

# PROGRAMME



SUNDAY | AUGUST 31, 2014

arrivals

18:30–21:00 Welcome Party (Continental Hotel)

MONDAY | SEPTEMBER 1, 2014

08:00 Breakfast

09:00 Opening Talks

## SESSION 1 | NUMERICAL METHODS I

chaired by Eric Munro and Bohumila Lencová

09:10 F. H. Read

**1** Achieving the highest accuracy with the BEM (invited)

09:40 J. Zlámal, B. Lencová

**2** Influence of saturation of magnetic lens material on fields of deflectors and parasitic fields

10:00 M. Oral, V. Neděla

**3** Dynamic correction of higher order deflection aberrations in the environmental SEM

10:20 R. Andrzejewski, D. Dowsett

**4** Optimization of mass spectrometer design by spatial manipulation of SIMION field arrays

10:40 Coffee Break

## SESSION 2 | MASS SPECTROMETERS I

chaired by Hermann Wollnik and Erich Plies

11:00 H. Wollnik

**5** High-resolving mass analyzers (invited)

11:20 Y. H. Zhang, H. S. Xu, Yu. A. Litvinov and CSR collaboration

**6** Precision mass measurements of short-lived nuclides at storage ring in Lanzhou (invited)

11:50 H. Geissel, J. S. Winfield, G. P. A. Berg, T. Dickel, B. Franczak, E. Haettner, N. Iwasa, G. Münzenberg, W. R. Plass, C. Scheidenberger, H. Weick, M. Winkler, M. Yavor

**7** The challenge of high-resolution spectrometer experiments with exotic nuclei at GSI-FAIR

13:00 Lunch

9<sup>TH</sup>

# INTERNATIONAL CONFERENCE ON CHARGED PARTICLE OPTICS

AUG 31–SEP 5, 2014

Hotel Continental | Brno  
Czech Republic

## SESSION 3 | ENERGY SPECTROMETERS

chaired by Anjam Khursheed

14:00 A. Khursheed

**8** The scanning electron microscope and electron energy spectrometer attachments (invited)

14:30 I. F. Spivak-Lavrov, L. M. Nazarenko, E. M. Yakushev

**9** Meshless energy analyzer of the cylindrical mirror type

14:50 A. Srinivasan, A. Khursheed

**10** Experimental results from a radial mirror analyzer (RMA) attachment for scanning electron microscopes (SEM)

15:10 K. H. Cheong, W. Han, A. Khursheed, K. Nelliyan

**11** A parallel radial mirror energy analyser attachment for the scanning electron microscope

15:30 Coffee Break

## SESSION 4 | ACCELERATOR OPTICS I

chaired by Martin Berz and Andreas Lehrach

16:00 M. Berz

**12** Optics and nonlinear effects in repetitive systems (invited)

16:30 R. Hipple, M. Berz

**13** High-order modeling of fringe field effects in storage rings

16:50 J. Kunz, P. Snopok, M. Berz, K. Makino

**14** Matter-dominated muon accelerator lattice simulation tools for COSY Infinity

17:10 B. Loseth, M. Berz, H. Zhang, P. Snopok, J. Kunz

**15** Optics of ionization cooling channels under the influence of space charge

18:30 Dinner

## TUESDAY | SEPTEMBER 2, 2014

08:00 *Breakfast*

### SESSION 5 | SURFACE PHYSICS INSTRUMENTATION

chaired by Gerd Schönhense and Ilona Müllerová

09:00 G. Schönhense  
**16** **Fast k-space mapping of electronic bands using time-of-flight based cathode-lens microspectroscopy (invited)**

09:30 Ch. Tusche  
**17** **Frontiers of momentum microscopy: High resolution and spin-polarized measurements of the electronic structure of solids with strong correlations and spin-orbit coupling (invited)**

10:00 K. Matsuda, Š. Mikmeková, S. Ikeno  
**18** **TEM and SLEEM observation for equilibrium phase in Al-Mg-Si alloys added by Cu, Ag or Au**

10:20 V. Katsap  
**19** **Finding LaB<sub>6</sub> cathode workfunction**

10:40 *Coffee Break*

### SESSION 6 | ION OPTICS I

chaired by Pieter Kruit and Martin Winkler

11:00 M. Yavor, T. Dickel, W. R. Plass, J. Lang, H. Geissel, W. Lippert, C. Scheidenberger  
**20** **Novel ion-optical modes of ion isolation and measurements in multiple-reflection time-of-flight analyzers (invited)**

11:30 A. S. Berdnikov  
**21** **Pseudo potential and pseudo Hamiltonian description of the motion of charged particles in RF fields**

11:50 H. Wollnik, F. Arai, Y. Ito, M. Wada, P. Schury  
**22** **RF-carpets that compress wide ion clouds to narrow ion beams**

12:10 V. Shchepunov, A. Piechaczek, H.K. Carter, H. Wollnik  
**23** **Ion optics of a high-resolution multi-reflection time-of-flight mass spectrometer and separator ORISS**

13:00 *Lunch*

### SESSION 7 | NUMERICAL METHODS II

chaired by Eric Munro and Bohumila Lencová

14:00 Y. Ose, H. Sato, H. Morishita  
**24** **Simulation for the development of electron gun and detection system of the latest FE-SEM (invited)**

14:30 J. Kološová, T. Hrnčič, J. Jiruše, M. Rudolf, J. Zlámál  
**25** **On the calculation of SEM and FIB beam profiles**

14:50 T. Radlička  
**26** **Wave optical calculation of probe size in low energy scanning electron microscope**

15:10 D. Dowsett  
**27** **Advanced SIMION techniques: boundary matching and genetic optimization**

15:30 *Coffee Break*

**16:00 SESSION 8 | POSTER SESSION**  
(authors are present at their posters)

18:30 *Dinner*

## WEDNESDAY | SEPTEMBER 3, 2014

08:00 *Breakfast*

### SESSION 9 | ELECTRON OPTICS I

chaired by Peter Hawkes and Tomáš Radlička

09:00 S. Thomas, J. Hammer, P. Weber, P. Hommelhoff  
**28** **Can a quantum electron microscope achieve low-damage (biological) imaging? (invited)**

09:30 P. Kruit  
**29** **Electron optics for 10<sup>N</sup> parallel beams (N=2,4,6) (invited)**

10:00 R. M. Tromp  
**30** **Towards 1.5λ resolution with low energy electrons (invited)**

10:30 *Coffee Break*

### SESSION 10 | MASS SPECTROMETERS II

chaired by Hermann Wollnik and Erich Plies

11:00 A. S. Berdnikov, K.V. Solovyev  
**31** **Golikov theorem of ideal time-of-flight mass analyzers**

11:20 Z. Russell, E. X. Chen, J. J. Amsden, R. M. Danell, S. D. Wolter, Ch. B. Parker, M. E. Ghem, B. R. Stoner, J. T. Glass, D. J. Brady  
**32** **Greater than 10× throughput enhancement in magnetic sector mass spectrometry via aperture coding**

11:40 H. Q. Hoang, D. Dowsett, T. Wirtz  
**33** **A high performance compact magnetic sector mass spectrometer**

12:00 M. S. Verruno, D. Dowsett, T. Wirtz, S. Della Negra  
**34** **Development of a compact high performance mass spectrometer for combined TEM-SIMS nano-analytics**

12:40 *Lunch*

13:30 *Excursion with Dinner*  
-22:00

# THURSDAY | SEPTEMBER 4, 2014

08:00 *Breakfast*

## SESSION 11 | NUMERICAL METHODS III

chaired by Eric Munro and Bohumila Lencová

- 09:00 H. Zhang, Z. Tao, J. Portman, P. Duxbury,  
**35** C. Y. Ruan, M. Berz  
**The DA based MLFMA for 3D space charge field calculation and photoemission simulation**
- 09:20 E. Munro, J. Rouse, X. Zhu, V. Katsap  
**36** **E-beam interaction with multi-layered targets**
- 09:40 S. Krátký, M. Urbánek, V. Kolařík  
**37** **PEC reliability in 3D e-beam DOE nanopatterning**
- 10:00 V. Y. Ivanov  
**38** **Analytical technique in the boundary element method for 3-D self-consistent problems of electron optics**

10:20 *Coffee Break*

## SESSION 12 | ACCELERATOR OPTICS II

chaired by Martin Berz and Andreas Lehrach

- 11:00 A. Lehrach  
**39** **Beam and spin dynamics for hadron storage rings (invited)**
- 11:30 M. Rosenthal (on behalf of the JEDI collaboration)  
**40** **Investigation of beam and spin dynamics for EDM measurements at COSY**
- 12:00 K. Makino, M. Berz, E. Valetov  
**41** **Dynamics in electrostatic rings via high-order transfer maps**

13:00 *Lunch*

## SESSION 13 | ION OPTICS II

chaired by Pieter Kruit and Martin Winkler

- 14:00 G. Schwind  
**42** **High brightness ion sources for focused ion beam systems (invited)**
- 14:30 Y. Greenzweig, Z. Malamud, A. Raveh  
**43** **Avoiding bias of focused ion beam edge resolution measurements at high doses**
- 14:50 D. Dowsett, T. Wirtz, Y. Fleming  
**44** **SIMS based correlative microscopy: The ultimate combination of sensitivity and lateral resolution.**
- 15:10 O. De Castro, D. Dowsett, T. Wirtz, S. Della Negra  
**45** **First design steps of a high-brightness electro impact ion source for nano-applications**

15:30 *Coffee Break*

## SESSION 14 | ELECTRON OPTICS II

chaired by Peter Hawkes and Tomáš Radlička

- 16:00 A. Khursheed, W. K. Ang  
**46** **Ring-cathode focused electron/ion beam column designs**
- 16:20 A. M. Blackburn  
**47** **Optimum support width of annular apertures in the presence of edge charging**
- 16:40 M. Mankos, K. Shadman, A. T. N'Diaye, A. K. Schmid,  
**48** H. H. J. Persson, R. W. Davis  
**Electron optics for a monochromatic, aberration-corrected, dual-beam low energy electron microscope**
- 17:00 T. Sasaki, M. Sato, K. Hidaka, J. Onuki  
**49** **Beam characterization for scanning electron microscopes by the RPS and IPC methods**
- 17:20 W. Y. Chang, F. R. Chen  
**50** **A novel design used for DLVSEM**

18:30 *Dinner*

# FRIDAY | SEPTEMBER 5, 2014

08:00 *Breakfast*

## SESSION 15 | ABERRATION STUDIES

chaired by Harald Rose and Ondrej Krivanek

09:00 H. Müller, S. Uhlemann, P. Hartel, M. Linck,  
**51** J. Zach, M. Haider  
**Development of modern TEM aberration correctors (invited)**

09:30 N. Dellby, G. J. Corbin, Z. Dellby, T. C. Lovejoy,  
**52** Z. S. Szilagy, O. L. Krivanek  
**Creating full control of all fourth and fifth order aberrations in C3/C5 aberration correctors (invited)**

10:00 R. Janzen  
**53** **Monochromatizing without filtering using dynamic fields without bunching: A new concept for d-TEM illumination**

10:20 R. Jagasia, M. Berz, B. Loeth  
**54** **Poincaré section method for beam element maps**

10:40 *Coffee Break*

## SESSION 16 | ELECTRON OPTICS III

chaired by Peter Hawkes and Tomáš Radlička

11:00 M. Mankos, K. Shadman, B. J. Siwick  
**55** **Electron mirror pulse compression for ultrafast electron diffraction and dynamic electron microscopy**

11:20 J. Hammer, S. Thomas, P. Weber, P. Hommelhoff  
**56** **A microwave-chip based beam splitter for low-energy electrons**

11:40 I. S. Hwang, C. Y. Lin, W. T. Chang, W. H. Hsu  
**57** **Low-energy electron diffractive imaging based on a single-atom electron source**

12:00 K. Chang, Z. Tao, H. Zhang, J. Portman, D. Nan,  
**58** K. Makino, M. Berz, P. M. Duxbury, M. Crimp, C. Y. Ruan  
**Development of high-brightness ultrafast electron diffraction and microscopy for functional imaging of nanomaterials**

12:20 X. J. Wang  
**59** **MeV ultrafast electron diffraction and imaging**

13:00 Closing Talks

13:30 *Lunch*

*Departures*

# POSTERS

Posters displayed from **MONDAY | SEPT 1, 11:00** to **FRIDAY | SEPT5, 11:00**

Authors present at posters:

**TUESDAY | SEPTEMBER 2, 16:00–17:30**

EO1 <b>60</b>	A. T. Ibrayev, A. A. Ibrayev, M. S. Nurmanov, A. K. Shaikhin <b>Electron-optical characteristics of 4-electrode and 6-electrode doubly-symmetrical immersion lens</b>
EO2 <b>61</b>	V. Katsap, C. Lai <b>Emission imaging of a LaB<sub>6</sub> emitter</b>
EO3 <b>62</b>	A. Knápek, T. Radlička, S. Krátký <b>Design and simulation of a carbon nanotube electron source</b>
EO4 <b>63</b>	C. Y. Lin, W. T. Chang, W. H. Hsu, W. C. Lai, Y. S. Chen, I. S. Hwang <b>Low-keV electron column based on a single-atom electron source</b>
EO5 <b>64</b>	F. Mika, I. Konvalina, Ch. Walker <b>Imaging with STEM detector, experiments vs. simulation</b>
EO6 <b>65</b>	T. Řiháček, M. Lenc, I. Müllerová <b>Measurement of coherence properties of scanning electron microscope</b>
EO7 <b>66</b>	O. Sise <b>Imaging properties and aberration analysis of electrostatic afocal-zoom lenses using computer optimization</b>
AS1 <b>67</b>	S. B. Bimurzaev, E. M. Yakushev <b>A simple corrector of electron lens aberrations with an electron mirror</b>
AS2 <b>68</b>	A. Khursheed, W. K. Ang <b>An on-axis electrode aperture unit for spherical aberration correction</b>
AS3 <b>69</b>	T. Ogawa, B. Cho, S. J. Ahn <b>A novel monochromator of double cylindrical lenses</b>
IO1 <b>70</b>	K. Marianowski, E. Plies <b>Experimental results using a low-energy FIB column with minimised Coulomb interaction</b>
IO2 <b>71</b>	O. Sise, P. Y. Nabhiraj, R. Menon <b>Analysis of optical column for plasma ion source based focused ion beam system</b>
IO3 <b>72</b>	D. Grinfeld, Ch. Hock <b>On equilibrium of ions confined in a periodic RF field in presence of a buffer gas with intermediate pressure</b>
IO4 <b>73</b>	S. B. Bimurzaev, N. U. Aldiyarov, M. M. Magzom <b>High dispersive electrostatic mirrors with spatial and time-of-flight focusing of the second order</b>
IO5 <b>74</b>	M. V. Dubkov, V. V. Ivanov <b>Separation of the parent ions by using mapping features of quadrupole lens</b>
AO1 <b>75</b>	J. Y. Kim, S. G. Hong, J. W. Kim, W. Wan <b>Beam optical study of in-flight fragment separator using a high power primary beam in the energy of a few hundred MeV/u</b>
AO2 <b>76</b>	M. O. A. El Ghazaly, A. S. Jabr, P. Defrance <b>Design of a low-energy electrostatic storage ring, under consideration of 3D fields</b>
MS1 <b>77</b>	D. Grinfeld, M. Monastyrsky, M. Skoblin, I. Kopaev, A. Makarov <b>Aberration and space-charge effects control in the Orbitrap mass analyzer</b>
MS2 <b>78</b>	I. F. Spivak-Lavrov, O. A. Baissanov, L. M. Nazarenko, E. M. Yakushev <b>Simple direct-flow TOF MS on the basis of the wedge-shaped mirror with two-dimensional field</b>

MS3 <b>79</b>	I. F. Spivak-Lavrov, O. A. Baissanov <b>New circuits of multipass TOF MS on the basis of a wedge-shaped electrostatic mirror with two-dimensional field</b>
ES1 <b>80</b>	I. A. Averin <b>Parallel acquisition electrostatic and magnetostatic energy spectrographs based on Euler' homogeneous potentials</b>
ES2 <b>81</b>	G. Lebedev, A. S. Tremsin, Z. Hussain <b>High energy and spatial resolution time-of-flight photoemission spectroscopy microscope (TOF-PESM)</b>
ES3 <b>82</b>	K. H. Cheong, A. Khursheed <b>Computational optimization of multi-channel electron energy spectrometer design</b>
ES4 <b>83</b>	V. S. Gurov, P. I. Kuksa, A. A. Trubitsyn <b>Focusing properties of hyperbolic fields</b>
ES5 <b>84</b>	J. S. Winfield, H. Geissel, T. Aumann, G. P. A. Berg, B. Franczak, G. Münzenberg, C. Scheidenberger, H. Simon, T. Uesaka, H. Weick, M. Winkler, M. Yavor, R. G. T. Zegers <b>Dispersion-matched modes of the in-flight separator super-frs and its combined spectrometers</b>
SPI1 <b>85</b>	T. Nakashima, H. Murata, H. Suhara, H. Shimoyama <b>Method of estimating charge density distribution on dielectric surface</b>
SPI2 <b>86</b>	A. Srinivasan, A. Khursheed <b>Material characterization by energy filtered secondary electron signals inside the scanning electron microscope (SEM)</b>
SPI3 <b>87</b>	M. V. Dubkov, P. I. Kuksa, D. Yu. Tarabrin, A. A. Trubitsyn <b>AES-SIMS combine</b>
SPI4 <b>88</b>	L. Frank, I. Müllerová <b>Optimizing the recognition of surface crystallography</b>
NM1 <b>89</b>	M. Horák, J. Zlámal <b>Accurate interpolation of 3D fields close to the optical axis</b>
NM2 <b>90</b>	R. Giles, A. Kalimov, D. Lysenko <b>Application of singular finite elements for improving accuracy of the BEM solutions</b>
NM3 <b>91</b>	J. Zelinka, M. Oral, T. Radlička <b>Simulation of space charge effects in electron optical systems based on the calculation of current density</b>
NM4 <b>92</b>	H. Murata, M. Ishigami, H. Shimoyama <b>Development of boundary magnetic charge method for computing fields in saturated magnetic materials</b>
NM5 <b>93</b>	W. K. Ang, A. Khursheed <b>Direct ray tracing of scanning electron microscope optics from cathode-tip to specimen</b>
NM6 <b>94</b>	O. D. Potapkin <b>Analytical method for electron gun calculation</b>
NM7 <b>95</b>	O. D. Potapkin, A. A. Melnikov <b>Collection efficiency and mark detection</b>
NM8 <b>96</b>	A. A. Trubitsyn, V. S. Gurov <b>Monte Carlo technique of simulation of electron motion in gas</b>
NM9 <b>97</b>	V. Neděla, I. Konvalina, M. Oral <b>Simulation of energy distribution of signal electrons detected by the segmental ionization detector in high pressure conditions of ESEM</b>
NM10 <b>98</b>	A. T. Ibrayev <b>Theory of cathode lens with multipole components of electrostatic field and the space charge</b>
ES6 <b>99</b>	T. J. M. Zouros, A. Kanellakopoulos, I. Madesis, A. Dimitriou, M. Fernández-Martín, G. Martinez, T. J. Mertzimekis <b>The optimization of a 4-element input lens on a hemispherical deflector analyzer using simion</b>