Exploring the chemical nature of super-heavy main-group elements by means of efficient plane-wave density-functional theory by Lukas Trombach, Sebastian Ehlert, Stefan Grimme, Peter Schwerdtfeger and Jan-Michael Mewes. Presenting an accurate yet efficient plane-wave DFT approach for the computational exploration of the bulk properties of the super-heavy main-group elements including copernicium (Cn–Og, Z= 112–118).
Objectives of the Research Centre: Our objective is to advance and disseminate knowledge in the area of theoretical/computational chemistry and physics, and to maintain high international standards in this research field only matched by top research institutes worldwide.

All objectives are clearly met. We are one of the most productive and internationally acclaimed theoretical research centres in New Zealand, with truly outstanding performances by each of our staff members. Our research centre has not been without a Marsden grant running since it was established in 2004. Joachim Brand is actively involved in the Dodd-Walls CoRE for Photonics and Quantum Technologies, and Peter Schwerdtfeger was part of the Norwegian Centre for Advanced Study (CAS) to perform research in the field of Chemistry at Extreme Conditions. Peter Schwerdtfeger is part of a new CoRE initiative of Auckland University to address ecology/socio-ecological systems/connected ecosystems/connected solutions. He has also received a Dumont d’Urville application in 2019 together with the atomic physics group at CNRS (CE), Laboratoire Kastler Brossel in Paris (NZ$ 80,000 for 2 years). Our articles appear regularly in top international journals (this year the Schwerdtfeger group had one paper in Physical Review Letters on Material Size Dependence on Fundamental Constants, and two in Angewandte Chemie on superheavy elements). The many high-standing international visitors who joined our research centre in 2019, and the many invitations to international conferences and talks at universities received by our staff, are a clear indication of our success and worldwide recognition.

Research Output: This year we published 22 papers in international journals.

Activities and achievements: All members of CTCP were actively involved in chemistry and physics teaching as outlined in Appendix 4. Almost all postdoctoral fellows helped in laboratory teaching at year 1 level. All articles are published in highly acclaimed international journals of high impact factors. Amongst the outstanding achievements this year is the worldwide attention and press releases on the melting of copernicium, which featured in the list of top 10 chemistry news in 2019. Peter Schwerdtfeger received the Dan Walls medal by the New Zealand Institute of Physics. The award is presented annually to a physicist working in New Zealand for at least ten years who is deemed to have made the greatest impact both nationally and internationally in his or her field of research.

The Future - Opportunities, Risks and Directions: We are (and continue to be) a top research centre of international high standing. This we achieve despite very limited financial resources available and little moral support. Unnecessary bureaucratic hurdles are put into place making academic life very difficult. The risks are very clear: Other universities overseas are far better resourced. We have already experienced the loss of excellent staff. Yet we are contributing enormously to the international reputation of Massey University and therefore deserve better recognition.

Work in progress: See attachment for more details.

Financial: See Appendix 4.
Acknowledgment: The Director is grateful to all CTCP members for their outstanding performance and very hard work in 2019, and wishes everybody an even more successful and productive year 2020 despite the financial and pressure imposed upon the College of Science and our Institute. My very special thanks go to our Institute’s secretary, Mrs Vesna Davidovic-Alexander (IAS), who has helped us so much to run our research centre, organizing conferences and meetings, looking after our overseas visitors, and relocating the NZIAS to new premises. We acknowledge on-going support by the Pro-VC Prof. Ray Geor as well as Liz Thaisen (for financial advice). We are also grateful to Mike Yap for his excellent support in terms of system administration.

Distinguished Prof. Peter Schwerdtfeger
Director of CTCP, HOI NZIAS
Date: Tuesday, 21 January 2020
Appendix 1

Research and Teaching Objectives for 2020

- J. Brand will continue work on his Marsden project (with Profs. Ali Alavi of Max Planck, and Martin Zwierlein of MIT), which continues until the end of April 2021. The postdoctoral fellows on this project Dr. P. Jeszenszki will finish at Massey and move to take up a new postdoctoral fellowship at the Eötvös University in Hungary. The PhD student on the project, Mingrui (Ray) Yang will be working full time on the project throughout 2020. J. Brand will also continue to lead the project “QF2b: Topological excitations and gauge theories” funded by the Dodd-Walls Centre (a TEC-funded CoRE) as PI. A postdoctoral fellow (Dr. J. Major) will be working full time on this. A second PhD student (Sarthak Choudhury) has recently started and will reinforce the research on the DWC project. He is expected to pass through the confirmation procedure in early 2020, J. Brand will further apply for new Marsden funding in the 2020 round after becoming eligible again to apply as a PI.

- M. Raduban will finish work on her collaborative research projects with Tohoku University on the band gap calculations of XAG (X = Y, Lu and Gd) crystals for scintillator applications and her collaborative research project with Osaka University on the investigation of fluoro-oxide glasses as neutron scintillators. She will then start work on her MURF project on exploring wide band gap fluorides as vacuum ultraviolet light emitters and her SREF project on the improvement of high energy radiation detection. M. Raduban is scheduled to stay at Osaka University from January to March 2019 as a full time Lecturer working on scintillators for neutron detection in laser fusion research. She is also scheduled to give invited talks at the Laser, Optic Science and Photonics conference in Valencia, Spain from 14-16 April and the 11th International Conference on Photonics and Applications in Danang, Vietnam from 2-6 November. In regard to teaching, M. Raduban will coordinate and teach into the new 124.103 Biophysical Principles course in semester 1 and teach into the new 124.105 Physics 1B: Electricity, Waves and Modern Physics in semester 2.

- P. Schwerdtfeger will continue his work on the Marsden grant (together with Prof. Witek Nazarewicz, Michigan State) to understand the nuclear structure and physical behaviour of the heaviest elements in the periodic table. He will continue to work on a Dumont d’Urville funded collaboration on the electronic structure of superheavy elements together with Prof. Paul Indelicato (Paris). The scholarship allows also for two symposia on this topic, both scheduled for April and December 2019 (in Paris and Auckland). These funded projects will involve longer visits by PS, Morten Piilebøt (PhD candidate) and Odile Smits (postdoctoral fellows) to both labs in Paris and Lansing. PS will collaborate with several research groups overseas, namely with Victor V. Flambaum (Sydney), Lukas Paštěka (Bratislava), and Anastasia Borschevsky (Groningen) on physics beyond the standard model. Research will also focus on lattice sums (together with AProf. Shaun Cooper), quantum confinement (together with Prof. Hans-Joachim Werner, Stuttgart) and Parity Violation in Chiral Molecules (together with Prof. Guntram Rauhut, Stuttgart). For 2019, PS is also an invited/plenary speaker at a number of international conferences and meetings overseas, and organizer of a conference on the “Mathematical Methods in Chemistry” in Rota, Spain. One of my PhD students will most likely finish end of 2020. PS will also be busy giving public lectures overseas and filing a new Marsden application.
Appendix 2

1. Research Output, Publications and Reports

Articles published in 2019 refereed journals (2019 members of CTCP are in bold letters):


Refereed Conference Proceedings and arXiv:


Chapters in Books:

NA

Software developments:

**J. Brand, E. Pahl, M. Yang**: Julia FCIQMC: A Julia program to calculate ground state properties of bosonic systems.

**P. Jeszenszki, U. Ebling**: Contributions to the development of NECI program package for calculation of low-energy states of molecules, solid-state systems and ultracold atoms (https://github.com/ghb24/NECI_STABLE)

P. Schwerdtfeger: Program SAMBA: A Fortran program to calculate solid state properties through many-body expansions.

P. Schwerdtfeger and A. Burrows: Program LatticeSum: A Fortran program to calculate lattice sums for cubic and hexagonal closed packed lattices.


2. Conference and Workshop Presentations

Lectures at Conferences / Meetings / Workshops:

- P.Jerabek gave a contributed talk with the title “Why the Noble-gas Group Element Oganesson is neither noble nor a gas” at the Chemiedozententagung 2019, Koblenz (Germany).
- M. Raduban gave a plenary talk on “Towards the development of fluorine-based crystal and glass scintillators” at the 6th Academic Conference on Natural Science for Young Scientists, Master, and PhD Students from ASEAN Countries (CASEAN-6) in Thanh Nguyen, Vietnam, 24 October 2019; an invited talk on at the 6th Conference on Applied and Engineering Physics (icaep-6) in the “Development of detectors based on wide band gap fluorides” at Thanh Nguyen, Vietnam, 22 October 2019; an invited lecture on "Rare earth ion-doped fluoride glass as fast-response scintillator for nuclear fusion experiments" at the New Zealand Institute of Chemistry Conference 2019 (NZIC2019) in Christchurch, New Zealand, 27 November 2019, and an invited lecture on “Wide band gap fluoride materials and its applications” at the International School on Applied and Engineering Physics in Hanoi, Vietnam, 20 October 2019.
- P. Schwerdtfeger gave an invited talk on “From Sticky Hard Spheres to Lennard-Jones potentials, Epstein zeta functions and many-body expansions for rare gas solids” at the Telluride Conference on “Intermolecular Interactions: New Challenges for ab initio Theory” (USA, March 17-22); an invited talk on “On The Problem of Sticky Hard Spheres” at the CMMSE2019, 18th International Conference on “Computational and Mathematical Methods in Science and Engineering”, Cadiz (Spain), June 30 - July 6; a plenary talk on “Going Superheavy – The Year of the Periodic Table” at the 10th Triennial Congress of the International Society for Theoretical Chemical Physics (ISTCP), Tromso, Norway, July 11-17, 2019; a plenary talk on “Beyond the Standard Model of Physics” at the Humboldt Conference in Medellin, Colombia, July 21-25; a keynote lecture on “Sticky Hard Spheres” at the Symmetry Conference in Bregenz, Austria, August 4-9; a keynote lecture on “Periodic Trends in Superheavy Elements” at the 6th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN19), Wilhelmshaven, Germany, August 25-30; a keynote lecture on “Variation of Fundamental Constants in Space-Time” at the XXXVI Mazurian Lakes Conference on Physics: Probing fundamental laws of nature with exotic nuclei and atoms, Piaski, Poland, September 1-7; invited talk on “The Year of the Periodic Table – Going
Superheavy” at the 9th Conference of the Asia-Pacific Association of Theoretical and Computational Chemists, Sydney, September 30 – October 3.

Seminars and Talks:

- J. Brand gave seminar talks at the Okinawa Institute for Science and Technology (OIST) on “Solitons, vortices, and quantum solitons” in Okinawa, Japan, and at the National Center for Theoretical Sciences (NCTS) in Hsinchu, Taiwan on the same topic. P. Jerabek gave a seminar talks on “The Prediction of Physical and Chemical Properties of Oganesson with Accurate Ab-initio Methods” at the GSI, Darmstadt (Germany), Chemistry Department of the TU Berlin, Berlin (Germany), Chemistry Department of the University of Graz, Graz (Austria), and the Helmholtz-Zentrum Geesthacht, Geesthacht (Germany).
- P. Jeszenszki gave a seminar talk on "Convergence properties of Fock-space based approaches in strongly correlated Fermi gases" at the Dodd-Walls Center’s Symposium (New Zealand, January 28 - February 1), a seminar talk on "Accurate Numerical Calculations for Strongly Correlated Fermi Gases with the Transcorrelated Approach" Dodd-Walls Center’s Quantum Fluids and Gases seminar (New Zealand, June 21), and at the 8th Annual International Laser Physics Workshop (South Korea, July 8-12), and an invited talk on the same topic at the NECTI Developer Meeting (Germany, October 1-2).
- M. Piibeleht gave a talk titled "New QED operators and updated CI program in GRASP" at the CompAS meeting in Brussels, Belgium (November 22-24).
- M. Raduban gave special seminars on “Wide band gap fluorides: from fast-response scintillators to ultraviolet laser materials” at the UNESCO International Centre of Physics in Hanoi, Vietnam, 1 November 2019; on “Rare earth-doped fluoride materials and its applications” at the Center of Excellence in Glass Technology and Materials Science (CEGM), Nakhon Pathom Rajabhat University, Thailand, 17 October 2019; and on “Wide band gap fluorides: from fast-response scintillators to ultraviolet laser materials” at the Department of Chemistry, Silpakorn University in Nakhon Pathom, Thailand, 18 October 2019.
- P. Schwerdtfeger gave a public lecture on “Das Periodensystem aus der Sicht eines Quantentheoretikers” at the Insitute Dr. Flad, Stuttgart (Germany), March 27. He also gave a talk on “Quantum Confinement”, CTCP Seminar Series (June 6); seminar at SNCS Massey on “The Gregory Newton Problem for Kissing Sticky Hard Spheres”, September 27; a public lecture on “The Periodic Table from a Quantum Theoretical Viewpoint” at the Karlsruhe Institute for Technology (Germany), November 14; a public lecture on “The Periodic Table from a Quantum Perspective” for the Fascination Science Series, Massey University, December 3.

Poster Presentations:

- J. Brand presented a poster on “Quantum Dark Solitons in the one-dimensional Bose gas” at the Quantum Simulation and Enabling Technologies Workshop 2019 in Sydney 3-4 October 2019, and on “Pushing the limits of exact diagonalization approaches for ultracold atom problems” at the International Conference on Laser Spectroscopy (ICOLS) in Queenstown, NZ 8-12 July 2019.
- M. Piibeleht presented a poster on "New QED operators and updated CI program in GRASP" at the Solvay Workshop on 'New Frontiers in Atomic, Nuclear, Plasma and Astrophysics' in Brussels (November 25-27).
- O. Smits presented a poster on "Ab-initio Monte Carlo melting simulations of oganesson" at TAN19 (Wilhemshaven, Germany), Aug 25-30 2019. She won first price for her poster; on "Impact of nuclear charge densities on the electronic shell structure for the superheavy elements" at Mazurian Lakes Conference (Piaski, Poland), Sept 1-7 2019.

- M. Raduban presented a poster on “Tuning the band gap of laser crystals through high-pressure application” at the 8th International Symposium on Optical Materials in Wroclaw, Poland, 11 June 2019.
Appendix 3

1. RESEARCH

Current Areas of Research Activities:

Biomolecular Simulations
Cluster Simulations and Phase Transitions, Nanoscience
Conﬁned Atoms and Molecules
Development of new methods for electronic structure calculations
Electron Electric Dipole Moment
Electroweak Electronic Structure Theory
Force Field Parameterisation
Frequency shifts in atomic clocks
Full Conﬁguration Interaction Quantum Monte Carlo for bosonic systems
Graph theoretical and topological properties of fullerenes
Heterogeneous and Homogeneous Catalysis
High-Pressure Physics
Integrated Nanophotonics
Lattice Sums for extended systems
Macroscopic quantum superpositions
Matter-wave bright solitons
Method of Increments for bulk properties
Multiscale Simulation
Nonlinear waves in Bose-Einstein Condensates
Nonlinear classical and quantum waves in disordered potentials
Nonlinear photonic systems
Non-equilibrium phase transitions
Non-perturbative QED
Nuclear anapole moment
One-dimensional quantum ﬂuids
Optical properties for VUV lasers and scintillators
Parity violation in molecules
Polariton condensate network dynamics
Physics beyond the Standard Model.
Plane-wave pseudopotential development
Quantum dynamics of ultra-cold few-atom systems
Quantum enhanced precision measurement
Quantum Monte Carlo simulations of fermionic superﬂuids
Quantum ratchets with ultracold atomic gases
Relativistic Quantum Chemistry
Solid State Physics
Solitonic Vortices
Spin-dependent parity violation in diatomic molecules
Stochastic Resonance
Strongly correlated fermionic superﬂuids
Superheavy Element Chemistry
Symmetries and Ratchets
Theoretical Inorganic and Organic Chemistry
Thermodynamics of bulk metals
Theory of functional nanostructures; Spintronics
Topological and Graph Theoretical Aspects of Fullerenes
Transition Metal Catalysis and Theory of Chemical Bonding
Variation of Fundamental Constants in Space-Time
2. PROFESSIONAL LEADERSHIP AND ADMINISTRATION

Honours and Awards:

– J. Brand was named “Outstanding Referee” by the American Physical Society for refereeing contributions to the Physical Review journals. Three of our members, Odile Smits, Peter Jeszenszki and Lukas Trombach are recipients of the Dean’s List of Exceptional Theses.
– M. Raduban appointed 0.2 Lectureship at Osaka University.
– P. Schwerdtfeger received the Dan Walls medal by the New Zealand Institute of Physics. The award is presented annually to a physicist working in New Zealand for at least ten years who is deemed to have made the greatest impact both nationally and internationally in his or her field of research.

Publicity:

– P. Schwerdtfeger: The work of melting copernicium made it into the list of the top ten events in chemistry in 2019. Our research work on superheavy elements was highlighted in many news articles around the world and resulted in invitations to write article by Nature and JoVE.

Appendix 4

POST-GRADUATE SUPERVISION

Ongoing PhD Theses:

– Morten Piibeleht (second year): Relativistic and quantum field theoretic studies of many-body atomic and nuclear systems (Supervisors: P. Schwerdtfeger, P. Bowman).
Teaching:

- J. Brand is paper coordinator for 124.261 Nonlinear Physics and Chaos.
- M. Piibeleht demonstrated the 124.111 (Physics for Life Sciences) labs.
- M. Raduban is course coordinator for 124.171 Physical Principles for Engineering and Technology I (semester 1) and gave lectures (21 lectures), facilitated workshops (6 workshops), and demonstrated laboratories (6 laboratories) in the same course; and 124.172 Physical Principles for Engineering and Technology II (semester 2) and gave lectures (18 lectures) and facilitated workshops (5 workshops) in the same course.
- P. Schwerdtfeger gave lecture courses (20 lectures) on Environmental Chemistry within the paper Environmental and Analytical Chemistry 123.206 (semester 1), Introduction to Quantum Theory (20 lectures) for the Advanced Physical and Computational Chemistry paper 123.331 (semester 1).
- O. R. Smits was demonstrator at ...

Other activities:

Papers refereed:

- M. Raduban refereed in total 26 papers (rejecting 20% of invitations) from 11 different international journals including Optical Materials Express, Journal of Non-Crystalline Solids, Optics Express, Optics Communications, and APL Photonics.
- P. Schwerdtfeger refereed in total 25 papers (rejecting now 90% of invitations) from 11 different international journals including Angewandte Chemie and Physical Review Letters.

PhD/MSc and other theses refereed:

- J Brand refereed a PhD thesis and an MSc thesis from the University of Otago.

Graduate Summer School Organisation:

- J. Brand organized the Australian and New Zealand Summer School on Ultracold Physics (ANZSUP 2019) in Dunedin (21-25 January 2019) as chair of the organizing committee with eminent lecturers from the US (UC Berkeley), Europe (U Amsterdam), Australia and NZ attracting graduate students from NZ, AUS, and internationally.
- P. Jerabek was part of the organizing committee and teacher for the “Summer School/Workshop on Computational Chemistry: Knowledge for Tomorrow – Cooperative Research Projects in Sub-Saharan Africa” funded by the Volkswagen Foundation which took place at the University of Mauritius (Duration: 2 weeks).

Conference Organisation:

- P. Schwerdtfeger was part of the organizing committee for the CMMSE2019, 18th International Conference on “Computational and Mathematical Methods in Science and Engineering”, Cadiz (Spain), June 30 - July 6; and the 9th Conference of the Asia-Pacific Association of Theoretical and Computational Chemists, Sydney, September 30 – October
The XXXVI Mazurian Lakes Conference on Physics: Probing fundamental laws of nature with exotic nuclei and atoms, Piaski, Poland, September 1-7.

Conference Participation:

- See above.

Chairs at Conferences:

- J. Brand chaired a session at the International Conference on Laser Spectroscopy (ICOLS) in Queentown, NZ 8-12 July 2019.
- M. Raduban chaired sessions at the 6th Academic Conference on Natural Science for Young Scientists, Master, and PhD Students from ASEAN Countries (CASEAN-6) in Thanh Nguyen, Vietnam, 24-26 October 2019 and at the 6th Conference on Applied and Engineering Physics (iCAEP-6) in Thanh Nguyen, Vietnam, 22-26 October 2019.
- P. Schwerdtfeger chaired sessions at CMMSE2019, 18th International Conference on “Computational and Mathematical Methods in Science and Engineering”, Cadiz (Spain), June 30 - July 6; chaired the nuclear physics section at the 6th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN19), Wilhelmshaven, Germany, August 25-30; at the 9th Conference of the Asia-Pacific Association of Theoretical and Computational Chemists, Sydney, September 30 – October 3.

Boards / Editorial Boards / Professional Societies / Memberships:

- J. Brand was elected Vice President of the New Zealand Institute of Physics.
- M. Raduban served as guest editor for the special issue Optical and Optoelectronic Materials and Applications of the journal Applied Sciences.
- P. Schwerdtfeger served on the editorial board Molecular Physics, Journal of Computational Chemistry, Computational and Theoretical Chemistry, Fullerenes, Nanotubes and Carbon Nanostructures and Wiley Interdisciplinary Reviews (WIRE): Computational Molecular Science. He also served several on the MU Academic Board and the PBRF panel. He met with members of the International Academy of Quantum Molecular Sciences to select new fellows (Menton, France, July 5-8). He is also the Associate Editor of the newly created Wiley journal. He was also elected as national representative to the International Society for Theoretical Chemical Physics.

Community Outreach:

- M. Raduban and J. Brand demonstrated physics experiments at Massey University Open Day.

Visits:

- J. Brand visited Prof. Thomas Busch at the Okinawa Institute for Science and Technology (OIST) in Japan in June 2019, and Prof. Shih-Chuan Gou at the National Center for Theoretical Sciences (NCTS) in Hsinchu, Taiwan, and the Changhua University of Education in Changhua, Taiwan (July 2019).
- M. Piibeleht visited J.Grumer at Uppsala University in Uppsala, Sweden in October, and P.Indelicato in Paris, France in October-November.
- M. Raduban was a visiting researcher at the Institut Lumière Matière (ILM), CNRS,
Université Claude Bernard Lyon 1, France from 4-8 June 2019 (hosted by Prof. Georges Boulon); visiting academic staff at the Institute of Laser Engineering, Osaka University, Japan from 7-19 July and 7 October – 5 November 2019 (hosted by Prof. Nobuhiko Sarukura); and visiting researcher at the Institute of Physics, Vietnam Academy of Science and Technology from 20 October to 3 November 2019 (hosted by A/Prof. Minh Hong Pham).

- P. Schwerdtfeger visited the Institute Dr. Flad (March 22) and Stuttgart University (March 25-29). He also visited the Institute for Advanced Study (IAS) in Oslo to undertake research on “Chemistry at Extreme Conditions” (November 18-22).

Exchange Programs:

- Two exchange students were received from the Netherlands to work in J. Brand and P. Schwerdtfeger’s groups.

Grants Refereed:

- J. Brand refereed a grant for the Chilean government program CONICYT.
- M. Raduban served in the review panel for the Catalyst: Seeding grant of the Royal Society Te Apārangi (July 2019 call).
Appendix 4

Financial Statement:

Beside financial support from the College of Sciences through INMS and NZIAS, which covers salaries and administrative support, the following income through internal and external grants was received in 2019 (in NZ$):

**External Grants Received/Continuing:**

- J. Brand (PI, Marsden grant) $235,000  
- J. Brand (PI and Theme leader), CoRE grant of the Dodd Walls Centre. $181,000  
- M. Raduban (PI, MURF ) $ 11,000  
- M. Raduban (PI, Osaka University grant; AI Tohoku University grant) $ 10,000  
- P. Schwerdtfeger and E. Pahl (2nd year Marsden Fund) $303,333  
- P. Schwerdtfeger (1st year Dumont d’Urville, 4 months) $ 13,333

**TOTAL** $ 753,666
Appendix 5

Staffing

Personnel:
Dist. Prof. Peter Schwerdtfeger (Chemistry, Director of CTCP)
Prof. Joachim Brand (Physics, Deputy Director of CTCP)
Dr. Marilou Raduban (Lecturer, Physics)

Secretaries:
Vesna Davidovic-Alexander (NZIAS)

External:
Dr. Elke Pahl (Auckland University, Department of Physics)

Honorary Research Fellow:
Prof. Sergej Flach (Korea)

PhD Students:
Antony Burrows (Supervisors: P. Schwerdtfeger, Shaun Cooper and E. Pahl)
Sarthak Choudhury (Supervisors: J. Brand and E. Pahl)
Edison Florez (Supervisors: E. Pahl and P. Schwerdtfeger)
Péter Jeszenszki (Supervisor: J. Brand, finished January 2019)
Morten Piibeleht (Supervisors: P.Schwerdtfeger and P. Bowman)
Shamim Shadfar (Supervisors: P. Schwerdtfeger and J.R. Allison)
Odile Smits (Supervisors: E. Pahl and P. Schwerdtfeger, finished May 27)
Lukas Trombach (Supervisors: P. Schwerdtfeger and E. Pahl, finished April 2019)
Mingrui (Ray) Yang (Supervisors: J. Brand and E. Pahl)

Exchange Students:
Tom Reuvers (University of Applied Science in the Netherlands)
Steven van Ommen (University of Applied Science in the Netherlands)

Postdoctoral/Research Fellows:
Ulrich Ebling (Postdoctoral Fellow)
Paul Jerabek (Humboldt Feodor-Lynen Fellow)
Péter Jeszenszki (Postdoctoral Fellow)
Jan Mewes (Humboldt Feodor-Lynen Fellow)
Stefanie Mewes (Research Fellow)
Odile Smits (Marsden Postdoctoral Fellow)
Lukas Trombach (Postdoctoral Fellow)

Visitors from other institutions:
Long Term (1 month or more):
Prof. Victor Flambaum (University of New South Wales, Australia)
Prof. Paul Indelicato (Sorbonne Université, Paris, France)

Short Term for Talks and Collaborations:
Prof. Walter Knapp (Institute of Chemistry and Biochemistry, FU Berlin, Germany)
Dr. Andrzej P. Kadziela (Technical University of Ostrava, Krakow, Poland)
Dr. Ramis Movassagh (IBM T.J. Watson Research Center, MIT, USA)
Dr. Jook T. M. Walraven (University of Amsterdam, Netherland)