

7<sup>th</sup> Joint Workshop on High Pressure, Planetary, and Plasma Physics  
(HP4)  
October 10-12, 2018

## Conference Program

Wednesday, October 10		
12:00	Registration in DLR, Rutherfordstr. 2, 12489 Berlin	
13:30	Welcome and Introduction	<b>Rauer</b>
13:35	Chemical and isotopic constraints on the composition of the terrestrial planets ( <b>Opening Talk</b> )	<b>Becker</b>
Session I: Interior and Atmospheres of Exoplanets Convener: Wicht		
14:20	Remote Sensing of the Atmospheres of Exoplanets ( <b>Invited Talk</b> )	<b>Heng</b>
14:50	Modeling young Hot Jupiters as a window to formation processes - Do clouds influence the interior models of giant planets?	<b>Poser</b>
15:10	Coffee Break	
15:40	Measurability of the fluid Love number $k_2$ in WASP-121b	<b>Hellard</b>
16:00	Matrix-propagator approach to compute fluid Love numbers and applicability to extrasolar planets	<b>Padovan</b>
16:20	Effects of different equations of state on interior models of exoplanets	<b>Baumeister</b>
16:40	Coffee Break	
Session II: Molecular Systems I Convener: French		
16:50	Diamond strength measurements above the Hugoniot elastic limit ( <b>Invited Talk</b> )	<b>Fletcher</b>
17:20	Miscibility gap of hydrogen-helium mixtures	<b>Schöttler</b>
17:40	Equation of state and optical properties of shock-compressed C:H:N:O mixtures	<b>Guarguaglini</b>
18:00	Poster Session (Drinks and Snacks)	

**Thursday, October 11**

**Session III: Rocky/Icy Planets and their Materials**

Convener: Rivoldini

9:00	Iron and Iron alloys under extreme conditions for geoscience application	<b>Harmand</b>
9:20	On the trail of Uranus' and Neptune's diamonds via laboratory experiments using laser induced shock compression	<b>Schuster</b>
9:40	Ab initio study of Magnesium Oxide Properties under Super-Earth interior conditions	<b>Soubiran</b>
10:00	Structural studies of minerals and compounds at pressures above 200 GPa	<b>Khandarkaeva</b>
10:20	Mass-radius relations of rocky exoplanets and the B1-B2 mantle phase transition of ferropicicase (Mg,Fe)O	<b>Sohl</b>
10:40	Coffee Break	

**Session IV: Rocky Planets and their Evolution**

Convener: Plesa

11:10	Magma ocean crystallization and terrestrial planets dynamics	<b>Maurice</b>
11:30	Volatile degassing and chemical speciation of the C-O-H system in the Earth Magma Ocean scenario	<b>Ortenzi</b>
11:50	Stratification of Mercury's core	<b>Deproost</b>
12:10	Constraints on the lunar core composition and thermal state from geophysical data and thermodynamic properties of liquid iron-sulfur alloys	<b>Rivoldini</b>
12:30	Lunch Break	

**Session V: DAC Techniques and Applications**

Convener: Liermann

13:30	Simulating the effects of shock compression in dynamic diamond anvil cell experiments <b>(Invited Talk)</b>	<b>Langenhorst</b>
14:00	The Dynamic Resistive-Heated Diamond Anvil Cell: Compression under controlled compression rates and high temperatures	<b>San Jose Mendez</b>
14:20	New design of double-stage diamond anvils shaped from	<b>Dubrovinsky</b>

	single crystal diamond plate	
14:40	Toroidal diamond anvils for static compression experiments beyond 5 megabar	<b>Jenei</b>
15:00	Coffee Break	
<b>Session VI: Gas Giants</b> Convener: Nettelmann		
15:30	The interior of Jupiter ( <b>Invited Talk</b> )	<b>Helled</b>
16:00	The interior of Jupiter with Juno constraints: Importance of Equations of State	<b>Guillot</b>
16:20	Dynamo Action of Jupiter's Zonal Flows	<b>Wicht</b>
16:40	Discussion	
<b>17:00</b>	<b>End of Session</b>	
19:00	Conference Dinner at Ratskeller Köpenick	

**Friday, October 12****Session VII: XFEL and Shock Methods**  
Convener: Tschentscher

9:00	Measuring Plasma Parameters of Warm Dense Matter from X-Ray Thomson Scattering at the LCLS and the NIF <b>(Invited Talk)</b>	<b>Witte</b>
9:30	Rapid Target Heating with High Intensity XFEL Beams	<b>Hartley</b>
9:50	Studies of matter at extreme conditions using hard X-ray FELs	<b>Appel</b>
10:10	Polymorphism, amorphization and melting of SiO <sub>2</sub> and Mg-bearing silicates from in-situ X-ray diffraction of laser-driven shock-compression	<b>Hernandez</b>
10:30	Coffee Break	
<b>Session VIII: Molecular Systems II</b> Convener: Husband		
11:00	Theory and simulations of the compressive freezing to ice VII <b>(Invited Talk)</b>	<b>Belof</b>
11:30	Proton dynamics in high-pressure ice-VII from density functional theory	<b>Trybel</b>
11:50	Thermal conductivity of water plasmas from ab initio simulations	<b>French</b>
12:10	Final Discussion	
<b>12:30</b>	<b>End of Workshop</b>	

## List of Posters

<b>Abdussalam</b>	Electronic stopping power of warm dense matter from TDDFT - Ehrenfest dynamics
<b>Bender Koch</b>	Do impactites contain metal condensate from evaporated meteorite?
<b>Belof</b>	Nanosecond freezing of water near the metastability limit?
<b>Bethkenhagen</b>	DFT+U equation of state for iron oxide
<b>Csizmadia</b>	Love-number of WASP-18Ab
<b>Doherty</b>	Multicomponent Melting in a Heterogeneous Lunar Mantle after Magma Ocean Solidification
<b>Husband</b>	Isotopic shift of the insulator-metal transition in dense fluid hydrogen
<b>Liermann</b>	Implementations of DAC setup for DACS, DSDAC and DDAC experiments at the HED instrument of the European XFEL
<b>Nettelmann</b>	Static Love number $k_{nm}$ values of Jupiter from interior models
<b>Otzen</b>	DFT Calculations of the linear elasticity of quartz and implications for pressure-induced lamellar amorphization
<b>Ovsyannikov</b>	High-pressure behavior of $\text{Fe}_4\text{O}_5$ at low and high temperatures
<b>Plesa</b>	Seismic velocities in the martian mantle and crust calculated from a 3D thermal and mineralogical model
<b>Plückthun</b>	The dynamic diamond anvil cell (dDAC) at the HED instrument of the European XFEL
<b>Preisling</b>	The Melting Line and the Band Gap of Helium
<b>Ramakrishna</b>	First-principles study of the electronic structure and dielectric response function of diamond and other relevant high pressure phases of carbon up to 15 Mbar
<b>Redmer</b>	Paramagnetic-to-diamagnetic transition in dense liquid iron and its influence on electronic transport properties
<b>Ruedas</b>	Synthetic geophysical observables from martian mantle convection models, with application to InSight
<b>Rückriemen</b>	The Martian dynamo powered by Fe snow
<b>Scheibe</b>	Towards a new tool for modelling non-adiabatic giant planets
<b>Schölmerich</b>	Structure of $\text{SiO}_2$ melts at ultrahigh pressures – the experimental and ab initio approach
<b>Steinle-Neumann</b>	P-V-T equation-of-state of liquid Fe from ab-initio simulations to the TPa regime

