

Opportunities for Advancement of Studies of Matter at Extreme Conditions with APS/HPCAT-Upgrade

November 7-9, 2023

| Day 1 - Tuesday, November 7, 2023 | | |
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| 9:00 am – 9:45 am | Arrival and Registration / Badging | APS Atrium, Auditorium 402 |
| 9:45 am | Opening welcome by Nenad Velisavljevic, HPCAT Director | Auditorium 402 |
| 10:00 am - 11:30 am | <p style="text-align: center;">HPCAT 20year anniversary celebration</p> <ul style="list-style-type: none"> - LLNL Management - ANL Management - NNSA-HQ Representative - 30min Nenad Velisavljevic – HPCAT history and look ahead - 30min APS Director Laurent Chapon – update and overview of APS and APS-Upgrade | Auditorium 402 |
| 11:30 am | Anniversary Celebration – Cake cutting Photos Buffet Lunch | Lower Gallery |
| 1:00 pm | Start of Scientific Program | |
| 1:00 pm | Dr. Nenad Velisavljevic, HPCAT Director - High-pressure research and workshop charge and goals | Auditorium 402 |
| 1:30 pm | Dr. Gregory B. Stephenson, Argonne Distinguished Fellow and Former APS Director – Challenges and opportunities with next generation APS-U beam | Auditorium 402 |
| 2:00 pm | Dr. Dana Dattelbaum, LANL program manager – Overview of NNSA light source work current and future opportunities, such as DMSS | Auditorium 402 |
| 2:30 pm – 2:45 pm | Break | |
| 2:45 pm | Prof. Amy Clarke, Colorado School of Mines and Director of ACME2 SSAA Center - Overview of materials advances (new classes of advanced materials summary), challenges and needs for new x-ray diagnostics + new Advanced Characterization of Metals under Extreme Environments (ACME2) | Auditorium 402 |
| 3:15 pm | Dr. Jason Jeffries, LLNL Program Manager - Overview of materials advances and requirements (NNSA mission relevant) and needs for new x-ray diagnostics | Auditorium 402 |
| 3:45 pm | Dr. Nathan Barton, LLNL Program manager – Strength models and high P-T data needs toward development of next generation predictive models | Auditorium 402 |
| 4:15 pm | Break | |
| 4:30-6:30pm | Poster session | Lower Gallery |
| Day 2 - Wednesday, November 8, 2023 | | |

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| 8:00 am | Prof. Andrew Campbell, U. Of Chicago and Director of SEES – Overview of new Synchrotron Earth and Environmental Science (SEES) and future plans at light sources, including sector 13 at APS | | Auditorium 402 |
| 8:30 am | Dr. Michael Walter, Director of Earth and Planets Laboratory, Carnegie Institution for Science – Future opportunities and needs with high pressure and synchrotron studies in support of Earth and Planetary studies | | Auditorium 402 |
| 9:00 am | Dr. Maddury Somayazulu, ANL-XSD/HPCAT - HPCAT-Upgrade overview | | Auditorium 402 |
| 9:30 am | Coffee Break and head to breakout sessions | | |
| Breakout Sessions | | | |
| 10:00 am – 12:00 pm | Session 1 – E1100 Extending the practical limits of pressure, temperature, and strain rate | Session 2 – E1200 Advanced Materials | Session 3 – Lower Gallery Understanding the EOS, transformations, deformations, and bulk properties |
| 12:00 pm | Lunch | | Lower Gallery |
| 1:30 pm – 3:30 pm | Session 4 – E1100 Advanced X-ray capabilities | Session 5 – E1200 Platforms for extending P, T, shear, and strain extremes | |
| 3:30pm | Break | | |
| 4:00 pm- 5:30 pm | Tour of HPCAT facilities AND Breakout session leads work on note capturing | | HPCAT, Sector 16 Building 434E |
| 6:00 pm | Banquet Dinner | | ANL Guest House |

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| | Day 3 - Thursday, November 9, 2023 | | |
| 8:00 am | Dr. Sakura Pascarelli, Scientific Director at European XFEL – Overview of XFEL and opportunities with XFEL and Synchrotron light sources | | Auditorium 402 |
| 8:30 am | Dr. Peter Celliers (one of LLNL lead scientist on NIF ICF experiments) – Overview of recent NIF ICF success and further data needs from HPCAT and other platforms | | Auditorium 402 |
| 9:00 am | Dr. Chris Seagle, SNL Dynamic compression group manager - Pulsed power and dynamic compression experiments and | | Auditorium 402 |

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| | opportunities for further understanding of materials at extreme P-T and strain rates (also discuss difference/connection between static and dynamic and the evolving pulsed power user program) | | | | |
| 9:30 am | Mathew Cherukara, ANL-XSD Computational X-ray Science Group Leader – Big data science and ML developments at APS-ANL and application for x-ray sciences | | Auditorium 402 | | |
| 10:00 am | Coffee Break and head to breakout sessions | | | | |
| Breakout Sessions | | | | | |
| 10:30 am – 12:30 pm | Session 1 – E1100 Extending the practical limits of pressure, temperature, and strain rate | Session 2 – E1200 Advanced Materials | Session 3 – Lower Gallery Understanding the EOS, transformations, deformations, and bulk properties | Session 4 – 401-A5000 Advanced X-ray capabilities | Session 5 – 401-B2100 Platforms for extending P, T, shear, and strain extremes |
| 12:30 pm | Lunch | | Lower Gallery | | |
| 1:30 pm | FINAL report out by Breakout sessions chair | | Auditorium 402 | | |
| 2:30 pm | Dr. Nenad Velisavljevic and Dr. Maddury Somayazulu – Closing remarks | | Auditorium 402 | | |
| 2:45 pm | Adjourn and Additional Tours of HPCAT | | | | |