



CdTe Workshop Day 1 Agenda

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| 8:00 am - 8:30 am | Arrival | |
| 8:30 am - 10:00 am | Progress, Possibilities, and Challenges | |
| | Gang Xiong | Collaboration to achieve 25%: why and how |
| | Wyatt Metzger | Stepping up our game: progress and challenges in synthesis and characterization |
| | Sachit Grover | Challenges and possible pathways to 25% CdTe cell efficiency |
| | Adam Phillips | Back buffer requirements for high efficiency |
| | Kurt Barth | CdTe and CdSeTe device processing strategies and characterization to increase performance |
| | Inna Kozinsky | The need for shared and effective metrics to gauge the progress in CdTe PV |
| 10:15 am - 11:45 am | Advanced characterization | |
| | Jim Sites | What key information can straightforward PL provide? |
| | Darius Kuciauskas | Interface and bulk recombination in CdSeTe heterostructures and devices |
| | Zach Holman | Measuring implied current-voltage curves of Cd(Se)Te solar cells |
| | Yanfa Yan | Impedance spectroscopy analysis of CdTe thin-film solar cells |
| | Robert Klie | Characterization of interfacial co-passivation using STEM |
| | Michael Walls | Understanding CdTe/CdSeTe device performance using high resolution electron and ion optical techniques |
| 11:45 am - 12:30 pm | Lunch | On site, sponsored by Colorado State University |
| 12:30 pm - 2:00 pm | Interfaces | |
| | Stuart Irvine | Transparent back contacts – optimising the energy output of a CdTe solar cell |
| | Tom Myers | An investigation of PbTe and SnTe for back-side p-type contact materials |
| | Micheal Heben | Experimental Development of High Performance CdTe Back Contacts |
| | Bill Huber | Investigating whether strain and/or lattice mismatch affect CdZnTe alloy-based back contact performance |
| | Colin Wolden | Understanding the Oxide-Absorber Interface |
| | Craig Perkins | Analysis of front interfaces in CdTe devices by advanced electron spectroscopic methods |
| 2:15 pm - 4:00 pm | Absorber and Module Development | |
| | W. Sampath | Advances in processing CdTe devices and DFT simulations |
| | Michael Scarpulla | Fundamentals of As doping and lifetime in CdTe from bulk crystals |
| | Kelvin Lynn | Optimization of group V doped feedstock for high efficiency CdTe/CdSeTe thin film PV |
| | Yong-Hang Zhang | Epitaxial lift-off CdTe/MgCdTe double heterostructures for thin-film and flexible solar cells applications |
| | Heayoung Yoon | Design, fabrication, and characterizations of CdTe PERC structures |
| | Ray Hsiao | Electroplated CdSeTe solar modules at Reel Solar |
| | Al Compaan | Toledo Solar - vertical glass transport for high quality CdTe cells and modules |
| 5:30 pm | Dinner | 240 Union Restaurant, sponsored by First Solar |

Day 2 Agenda

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| 8:15 am – 8:30 am | Arrival |
| 8:30 am – 8:45 am | Breakout instructions |
| 8:45 am – 10:15 am | Discuss and respond to questions corresponding to breakout session (see topics below) |
| 10:15 am – 10:30 am | Break |
| 10:30 am – 11:30 am | Report out and discussion |
| 11:30 am – 12:15 pm | Lunch |
| 12:15 pm – 1:15 pm | Complete breakout session deliverable |
| 1:15 pm – 2:15 pm | Report out and discussion |
| 2:15 pm – 2:30 pm | Wrap up |
| 2:30 pm – 3:30 pm | Optional tour of NREL PV facilities |

Breakout Sessions

A. What are the top goals for the CdTe solar technology research community to reach 25% cell efficiency? Is there still a role for single crystal, MBE, and model systems, and if so how much of a role? Do we need more/less theory? How much should we weight GrV vs Cu work? How much should we weight interface, absorber, and integrated device studies? What are the top 3-5 technical issues to be addressed?

Provide 1-3 final takes on how work should be weighted on each top technical issue determined above

B. How can the CdTe community be better aligned in its work? How should we logistically attack these problems? How many laboratories should make polycrystalline devices from A to Z as opposed to focusing on one technical aspect (e.g. back contacts) leveraging materials from industry or elsewhere? How can collaboration be facilitated by DOE and industry given our constraints? What specific collaborations should be created that do not already exist?

Provide 3-5 follow up action items to improve our alignment after this workshop

C. Given the importance of CdTe in photovoltaics, what can we do to expand the relatively small and shrinking CdTe research community? What is useful and/or novel expertise that we are not using and should be? Who or what could change our capabilities for the better? How can we appeal to a broader funding base?

Provide 3-5 follow up action items to improve CdTe funding and the community after this workshop

D. What are visions for CdTe solar technology 15 years from now? What are the needed building blocks to get there? How will CdTe be differentiated from other technologies? What are key areas that need to be researched and developed? What is lacking in the current research portfolio to realize the long-term potential of CdTe solar technology?

Provide 1-3 long term objectives for CdTe solar technology and steps to realize these objectives