# Session V

Chaired by Kate Jones

## Dean Townsley - Novae and Type Ia Supernovae

Session 5 of #NucATown kicking off at 8:15am, starting off with "Novae and Type Ia Supernovae"

**Nuc Astro Town 2012**

Runaway is sensitive to accretion rate .... what are the observational uncertainties of the accretion rate? #NucATown

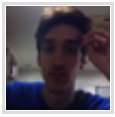
**Zach Meisel**

Dean Townsley (U. Alabama): Novae and Type Ia Supernovae #NucATown

**Derek Fox**

Townsley: Relevant nuclei for nova burning calcs can be measured in lab at astrophysical temps (<~ 100 keV) #NucATown

**Derek Fox**



Townsley: CO and ONe(Mg) WDs for novae. For the latter, some Mg but not *nearly* as much as previously thought! #NucATown

daid kahl

Townsley: Reaction rate measurements for novae much improved since 2002, work continuing #NucATown

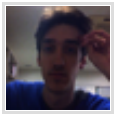
Derek Fox

what about SNIa p-process? #nucatown

Hendrik Schatz

Townsley: Most important step: Incorporate known Fe-group electron capture rates into rate theory - cannot measure all #NucATown

Derek Fox



Townsley: Comment: Fe-region Gamow-Teller strengths are experimentally about the best we can do A: Still need the reaction rates #NucATown

daid kahl

@HendrikSchatz #nucatown p-process calcs in SNIa use artificial, highly enhanced seed abundances. remains to be seen whether realistic

Thomas Rauscher

Townsley: Q: Spectroscopic constraints on the novae model? Comment (Starrfield): We don't know the accretion rate, basically #NucATown

daid kahl

@HendrikSchatz #nucatown it critically depends on the neutron capture seeds built up during the accretion. No detailed work in this, yet..

**Marco Pignatari**

@RauscherThomas #nucatown so what should/could be done to address this question?

**Hendrik Schatz**

#NucATown It is important to known format of EC rate tables (grid etc) in Fe region required by modellers of Ia supernovae.

**Remco**

@HendrikSchatz p-process may be possible in some models but not in others. #NucATown

**David Chamulak**

@HendrikSchatz #nucatown model s-processing accretion, in companion star, and in accreted layer... (plus accretion flow)

**Thomas Rauscher**

@HendrikSchatz @RauscherThomas If the traditional single degenerate channel could be ruled out it becomes harder if not impossible #NucATown

**David Chamulak**

@HendrikSchatz @RauscherThomas #nucatown we are

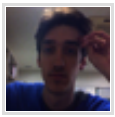
working in this in Basel. But until we do not do right the AGB, we cannot do this properly

**Marco Pignatari**

## Andrew Cumming - X-ray Bursts and Neutron Star Crusts

Andrew Cumming (McGill): X-ray Bursts and Neutron Star Crusts #NucATown

**Derek Fox**



Andrew Cumming (McGill): X-ray Bursts and Neutron Star Crusts #NucATown

**daid kahl**

Cumming: New burning regimes from recent obs, theory: rp-process powered tails (GS 1826-24), mHz QPOs as marginally-stable burning #NucATown

**Derek Fox**

Cumming: +Intermediate bursts as long He flashes #NucATown

**Derek Fox**

Cumming: Interactions/coupling between different burning regimes: superburst precursors; mHz QPO freq predicts burst time #NucATown

**Derek Fox**

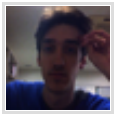
Cumming: Cooling of NS crusts observed with Chandra,

XMM, Swift - NS crust heating and transport properties #NucATown

**Derek Fox**

Cumming: Recent focus on systematic effects in X-ray burst spectra, refining ability to use them as probe of NS mass & radius #NucATown

**Derek Fox**

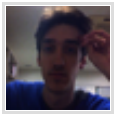


Cumming: Archival lists of X-ray Bursts RXTE and MINBAR #NucATown

**daid kahl**

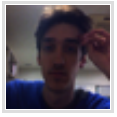
nova V1500 Cyg has 6e-4 solar mass ejecta (wg discussion). can one find model parameters that can reproduce this? #nucatown

**Hendrik Schatz**



Cumming: Until we understand spectral evolution, don't believe NS radii from Type I XRBs at better than 20% level #NucATown

**daid kahl**

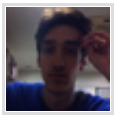


Cumming: Carbon burning may not be the answer for explaining the origin of superbursts... #NucATown

**daid kahl**

Cumming: What's next in theory? "Beyond 1D" Data now good enough to justify effort. #NucATown

Derek Fox



Cumming: Burst behavior w/ accretion rate; low rate - regular behavior (text book); high rate - irregular and rich phenomena #NucATown

daid kahl

Cumming: Nuclear experiment/theory: 1. Need masses, rates at proton drip line, at & beyond neutron drip line. #NucATown

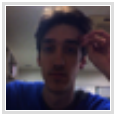
Derek Fox

Regarding future X-ray mssions - don't forget the upcoming Astro-H X-ray mission launching in 2014 #NucATown

Ed Cackett

Cumming: Nuclear experiment/theory: 2. Need thermal & transport properties of dense matter. #NucATown

Derek Fox



Cumming: Q: 1820 He accretor shows C superbursts... A: We don't know what's going on there, but C burning works for some cases #NucATown

daid kahl

## Andrew Davis - Opportunities with Grains

#NucATown what about C12+C12 uncertainty, AND uncertainty in relative probability of its nucleosynthesis

channels? Impact is known?

**Marco Pignatari**

Learning entirely new meaning for "neutron bursts" as applied to Solar System dust grains by Andrew Davis (Chicago) #NucATown

**Derek Fox**

#nucatown What do grains tell us about the p-process puzzles 92-94Mo?

**Artemis Spyrou**

#NucATown A. Davis and presolar grains: 1 presolar grain condensed from 1 star. Chance to test directly stellar nucleosynthesis.

**Marco Pignatari**