Class Presentations

Evaluation of Sci. Info (E)

Critical Analysis (C)

Understanding (U)

Organization (O)

Presentation Style delivery (P)

Ana

very good

E	10	45/50
C	8	
U	9	
O	9	
P	9	

- fracture w/ XFEM
- basic overview of XFEM + cracking
- listed governing eqns
- phantom nodes,
- started w/ crack propagation instead of initiation

* - what is the K_C - critical stress intensity factor?

* - in what ways does cracking affect fuel performance?

- benchmarked code, she liked this aspect

- why does hoop stress change from + to -

- crack length sensitivity
- they did not address heat transfer through cracks, through [illegible] adequately

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- understands concept of K_c from the paper
- got the hoop stress question correct

45/50 very good

E	9
C	8
U	9
O	10
P	9

Angelica L. Manley

- U_3Si_2 modeling - Barani
- inter + intra granular bubbles swelling
- DFT + BCA to approximate behavior
- approximate fission gas resolution
  - homogeneous resolution
- rate theory / cluster dynamics modeling
- parameterized this model
- calculated some data, used some references
- only looks @ hottest part of fuel pin
- good analysis of weakness of diffusion coefficients for Xe
- RED is good, but
- U_3Si_2 is not a [illegible] ceramic, so no...

- swelling is a sum of [illegible] + [illegible]
- UO_2 vs U_3Si_2

- had backup slides
- well prepared
- good answers to questions

Jurisd — pretty good

E	9	42/50
C	8	
U	9	
O	8	
P	8	

- AEH from Jason Hales
- coupling [illegible] and macro scale
- averaging out small scale structure to feed up to the macro scale
- benchmarked w/ different geometries
- examples of how this is important for real fuel systems?

- they are homogenizing elastic constants
- what features can be incorporated?
- scale limits?
- showed an example for hydride concentration
- max difference @ middle point, why?
- applied AEH for [illegible] UO_2 for FG bubbles

-

Quantum

- very good

E	8
C	10
U	9
O	8
P	8
	43/50

- FeCrAl multiphysics performance
  - compare Zircaloy to FeCrAl
  - normal operation
  - good background on FeCrAl

* - why increased time margin?
  - use Serpent for neutronics
  - good analysis for fuel-term issues
    - Not all interface T's identified
    - issues w/ the thermal expansion
  - used Zircaloy creep + no creep for FeCrAl
  - they don't present the creep model

* - do you expect FeCrAl to have more or less creep than Zircaloy

* - why dip in thermal exp. for Zircaloy
  - only presented few axial points for gap closure

* which axial points + how they would vary?

→ more a total criticism, less a review

→ gap closure

Fel:

~~Title~~ author. — tough paper, but decent job

→ thermomechanics + O diffusion in UO_2

→ established governing equations

→ poor quality graphics

→ talked through heat conduction + O transport eqn

E	9
C	9
U	9
O	8
P	8

43/50

→ very mathematical paper

→ don't love the form of the slides

— too much space, some no titles

* → why does O diffusion impact the centerline temperature?

→ pretty good critique

→ not physical, but an evaluation of the JFNK

→ ok job answering questions

→ expand

Alex Chrystler

- overall pretty good
- excellent presentation skills

- CANDU fuel thermochemistry

- RNFTT

→ I like his background

- modifying model to include noble metals

- account for variable U/O ratio

- good analysis & description of experimental methods

- [illegible] tracked O/M ratio as a function of time,

* - why initial 2.17 O/M ratio?

* - RNFTT vs Thermochimica?

* - what material or chemical systems?

→ least [illegible] answering questions

E	9
C	8
[illegible]	9
D	9
P	10

45/50

Chelsea Hall

did ok, not great

- CANDU nx fuel development
- CNL has significant fabrication

- NAU
  - nuclear reactor universal

- MOX fuels
- SIMFUEL

E 9
C 9
U 9
O 6
P 8
41/80

- overview of state of Canadian experimental efforts
- overview of multiscale modeling

- Seems a bit disorganized, but did some background work
- Canadian codes
  - Elesim, Elestres, Eleca
- put some effort, but might not fully understand
- reported on mesoscale models

- was this just a review article?
- ran quite long
- did ok on questions

Cole Takasugi: — very good job

- O transport in LWR fuel
- similar paper to Felix's or Alex's
- O transport, O chemical potential
- ORIGEN, Thermochimica + BISON

E 9
C 9
U 9
O 10
P 9
46/50

- O flux
  - used in FEM
  - could have done in finite volume?

- 2 problem cases
  * — both had fixed temperature profile?

- 3 sublattice model
  * — why 3 sublattices?
    — typically only two in UO_2

* — what is changing O potential at periphery?

- good cartoons
- well organized
- good answers to questions

Fu-Yuan

- ThO_2 fuel performance
- $(U,Th)O_2$ fuel development
- Th^{232}
- FAST performance code
  ThO_2 & Th-MOX
  - SCWR application
  - $(Th,U)O_2$ can be discussed for my SCWR slides
- good SCWR review!
- clearly laid out background work
- thermal cond. of UO_2 vs ThO_2?
- predict T_0
- ThO_2 has less diffusion than UO_2
  & what impacts can this have?
- don't have accurate elastic moduli for ThO_2?
- I agree with questions

E 9
C 8
U 9
O 10
P 1
45/50