

Emerging Technologies

- By definition, try to focus on technologies which are beyond the horizon. Roughly orthogonal to the other frontier tech discussions where focus is on technologies already anticipated -- more incremental, evolutionary.
- This leads to two challenges: (a) infinite space of possibilities (b) no natural way to identify what to look at.
- Rough categorization of topics:
 - (a) atomic scale manipulation of material properties
(ALD, quantum dots, nanoparticles, MBE, bandgap eng.)
 - (b) bulk material properties with novel properties
(graphene, amorphous silicon)
 - (c) novel techniques, methods, etc
(optical modulation, flexible circuitry, 3d printing, MEMs, etc)
 - (d) specific technologies (close to other frontier work)
(spectrally sensitive CCDs, ...)
- To date: gathering info, weekly phone meetings, etc. Much left to do.

Emerging Technologies

One-page summaries

- amorphous nanocrystal silicon (Roger Rusack)
- flexible circuits (Julia Thom)
- optical modulation for data transmission (Ted Liu)
- Graphene (Jim Alexander)
- quantum dots & nanoparticles (Lindley Winslow)

Notes:

SiPM without Si (GaAs, GaInP... radhard? SiC)
GaNi electronics? Satish Dawan...

Longer Whitepapers

- Isotope separation (Howard Nicholson)
- Plasma flat screen as detector (D.S. Levin, UMich)
- Graphene GFET sensors (Yong Chen, Purdue)
- High-Speed Optical Modulators (D. Underwood, ANL)
- Spectrally sensitive CCDs (Chris Kenney, SLAC; planned)
- Graphene review (Ani Sumant, ANL; planned)
- Atomic Layer Deposition (Mike Pellin, ANL; planned)

Incomplete Topics

- 3d printing (Science article)
- high magnetic field for smaller detectors.

**What ideas
are we
missing here?**

Tasks and Deadlines

1. Review last several years of instrumentation conference agendae.
2. Talk to GrandMasters of the field
3. Complete the set of planned whitepapers and summaries (1 month)
4. Add new topics and corresponding documentation. (1 month)
5. Prepare a three page condensation for inclusion in the 30-page Instrumentation Frontier Snowmass Report (by June 15th?)
6. Snowmass – do we need to organize sessions, speakers, etc?
7. After Snowmass: what?
8. What is missing from this list?