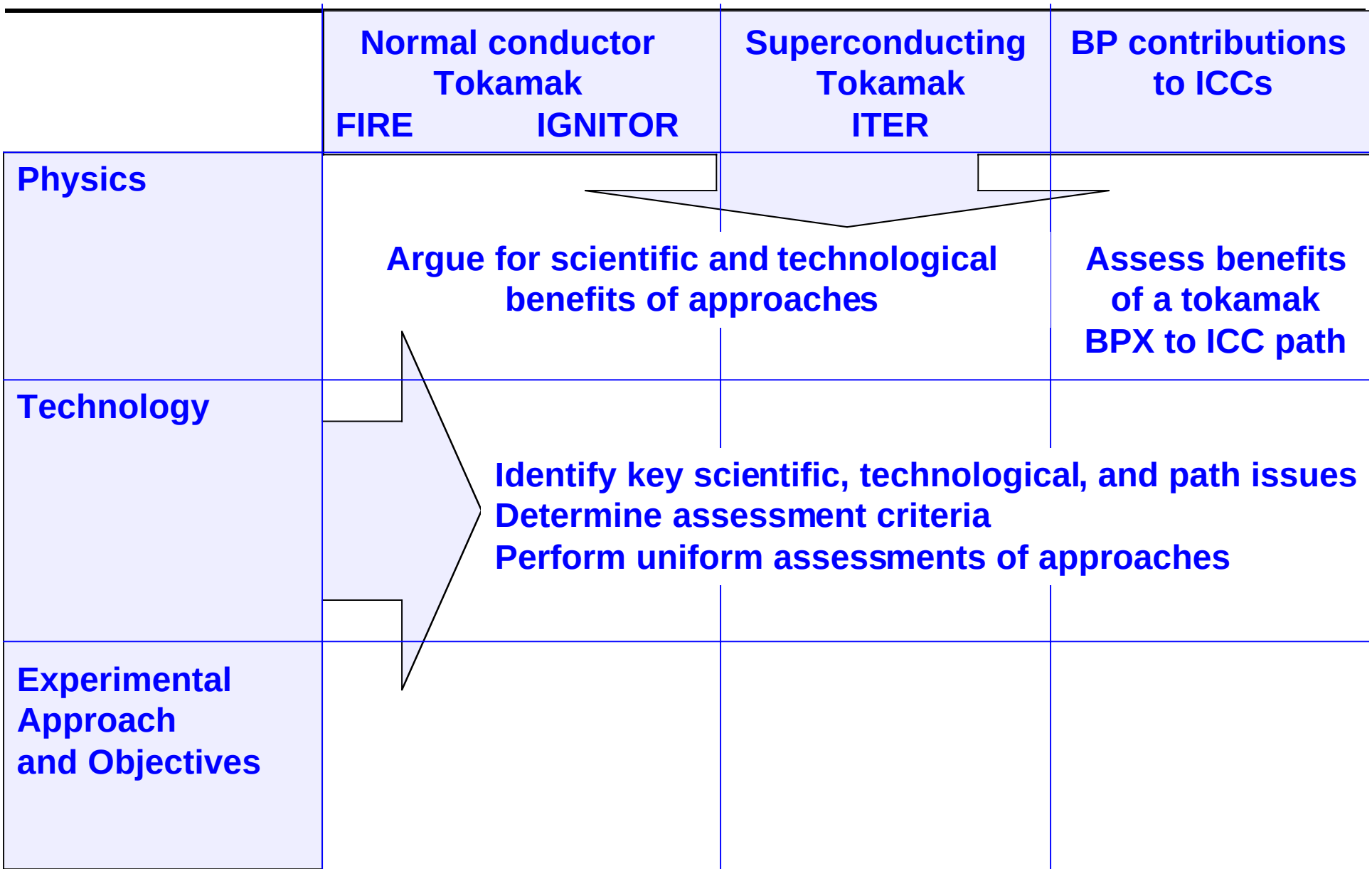
MFE Process and Products

Ned Sauthoff

Snowmass 2002 Information Session
APS/DPP Meeting
October 30, 2001

Identifying issues and assessing burning plasma experiments



Topical Groups' roles: motivating and assessing burning plasma experiments

Physics	Identify key scientific issues Determine criteria for assessment of approaches Perform uniform assessments of approaches	Wave–Particle Interaction MHD Transport Boundary Physics Alpha Physics
Technology	Identify key technological issues and potential benefits Determine criteria for assessment of approaches (feasibility, benefits, cost, ...) Perform uniform assessment	Magnets PFC/Heat removal Heating/CD Safety/Tritium/Materials Vacuum Vessel/Remote Cost
Experimental Approach and Objectives	Identify integration, research operations, development path, and "community" issues Determine assessment criteria Perform uniform assessment	Diagnostics Integrated Scenarios/ Ignition Physics/Burn Cont Physics Operations Development Path

Roles of approach-advocates and ICC community

Normal conductor Tokamak FIRE IGNITOR	Superconducting Tokamak ITER	BP contributions to ICCs
Argue for scientific and technological benefits of the approach: **– advocate scientific issues** **– suggest physics "rules" and "guidelines"** **– suggest assessment criteria** **– participate in plasma performance simulations and resultant assessments,** **championing the case for each approach**		Assess benefits of a tokamak BPX to ICC path - identify ICC issues (physics, technology, development path) - assess applicability of the tokamak results on the ICC development

A Vision of the MFE Final Report Structure

- Executive summary, integrating MFE and IFE [4 pages]
- Introduction, integrating MFE and IFE (goals, background) [3 pages]
- MFE burning plasma science and technology topics (intro, status, R&D needs, plasma requirements to address/resolve R&D needs) [20 pages]
- Approaches to MFE burning plasma studies, including relationship to ICCs, development paths, international context [10 pages]
- Key MFE scientific / technological / path issues, assessment criteria, and figures of merit [4 pages]
- Assessments of approaches to MFE burning plasmas [20 pages] --------
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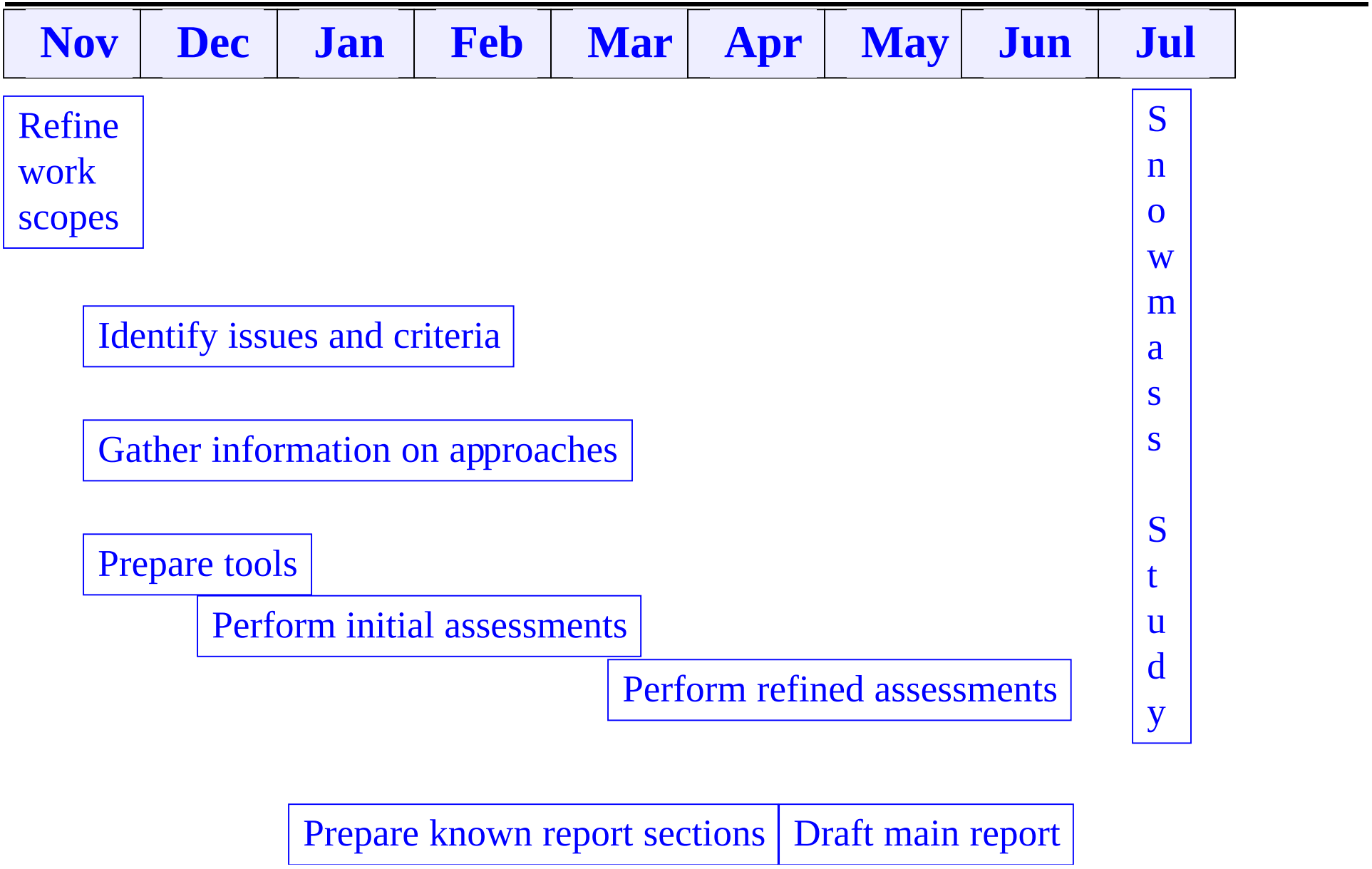
- MFE Appendices [50-100 pages]
- MFE Attachments [unlimited pages]

Roles in the Snowmass Process

- **Snowmass working/sub-groups and community participants**
  - Working Groups (rows) and Approaches (columns) document the known, refine the issues, criteria, and figures of merit, and specify/supply the tool set
  - Approaches(columns) advocate for concepts, participating with the working groups
  - Working Groups (rows) perform assessments on all the options uniformly

- **NSO**
  - provides integrated assessment tools
  - performs initial analyses and assists participants in their assessments

Upcoming activities



Group Leaders --- *GET INVOLVED!*

Normal conductor Tokamak		Superconducting Tokamak	BP contributions to ICCs
FIRE	IGNITOR	ITER	
Meade/Thome	TBD	Perkins/TBD	Hooper/Jarboe

Physics (Prager)	Transport	(Synakowski, Waltz)
	MHD	(Hegna, Strait)
	Energetic Particles/Alpha Physics	(Nazikian, Van Dam)
	Wave–Particle Interactions	(Batchelor, Porkolab)
	Boundary Physics	(Allen, Pitcher)
Technology (Baker)	Magnets	(Martovetski, Minervini)
	PFC/Heat removal	(Mattas, Ulrickson)
	Heating/CD	(Rasmussen, Temkin)
	Safety/Tritium/Materials	(Petti, Zinkl)
	Vacuum Vessel/Remote	(Nelson, Parker)
	Cost	(TBD)
Experimental Approach and Objectives (Taylor)	Diagnostics	(Boivin, Young)
	Integrated Scenarios/ Ignition Physics/Burn Control	(Kessel, Politzer)
	Physics Operations	(Wesley, ???)
	Development Path	(Najmabadi, Schoenberg)