

Five goals/questions

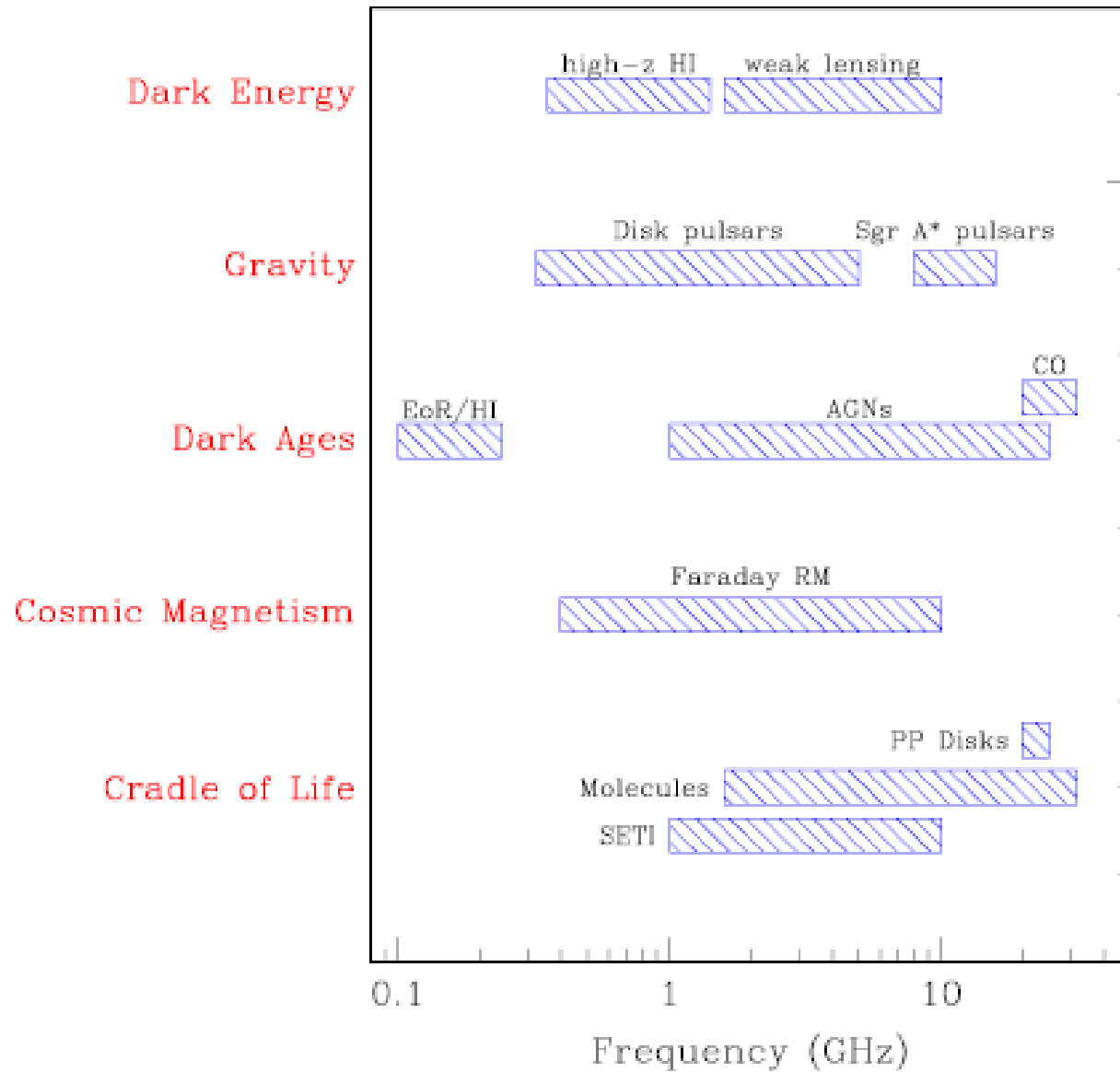
1. Clear statement of science objectives for the next decade and beyond
2. Identify what cm/m brings to a multi- λ context
3. Identify instrumentation requirements (flowdown from science areas)
4. Is the SKA project the solution to 3?
 - a. What is the SKA == what do WE want the SKA to be?
 - b. SKA = monolith or an observatory comprising several telescopes?
5. Build working partnership between the centers and universities/institutes.
6. What is the best way to partner with the international SKA project (if that's what we want to do)?
7. What do we "propose" to the next decadal survey?

Particular Goals

- Identify in broad terms what the cm/m program should consist of in 2010+
- Indicate as specifically as possible the direction the US would like to go vis a vis the SKA at the upcoming ISSC meeting (Dresden 28-30 Aug 2006)
- Develop the work plan for the revised US SKA Consortium's Technology Development Project (TDP)

Five Key Science Areas for the SKA

Topic	Goals
Dark Energy and Cosmic Structure	<ol style="list-style-type: none"> 1. Understand dark energy (eqn of state; $W(z) = P/\rho$) 2. Understand structure formation and galaxy evolution
Gravity: Pulsars & Black Holes	<ol style="list-style-type: none"> 1. Use precision timing of pulsars to test theories of gravity in the strong field limit 2. Pulsars with NS/BH companions (including Sgr A*)
Probing the Dark Ages	<ol style="list-style-type: none"> 1. Map out structure formation using HI from the era of reionization ($6 < z < 13$) 2. Probe early star formation using high-z CO 3. Detect the first active galactic nuclei
Cosmic Magnetism	<p>Determine the structure and origins of cosmic magnetic fields (in galaxies and in the intergalactic medium) vs. redshift z</p>
The Cradle of Life	<ol style="list-style-type: none"> 1. Understand the formation of Earth-like planets 2. Understand the chemistry of organic molecules and their roles in planet formation and generation of life 3. Detect signals from ET



Some context statements

- The international SKA project has growing momentum, with prospective construction funding from Europe and elsewhere early next decade
- Four sites have been proposed by host countries; they are now being short listed
 - Argentina/Brazil
 - Australia
 - China
 - South Africa
- US interests cover the entire frequency range proposed for the SKA (0.1 – 25 GHz) and beyond (as in EVLA science case)
- The full SKA cannot be built if the US is not involved

Context (continued)

- There is currently no active plan for expanding the collecting area or baselines of existing NSF-funded US telescopes
- It is not unreasonable to consider a \$500M investment in cm/m telescopes over the next 15 years owing to the great science return we can already recognize

Discussion Questions

- What are the priority science areas for US scientists and what new telescopes are needed to achieve the science goals?

Discussion Questions

- Over the next 15 years what should the US invest in for cm/m telescopes?
 - What should our investment be vs. frequency?
 - » Low-band: < 0.3 GHz
 - » Mid-range: 0.3 to ~ 2 GHz
 - » High-band: ~1 to 25 GHz (or higher)
 - Which existing facilities would be replaced/subsumed?
 - » When?
 - Which new observatories would be built as:
 - » US-only?
 - » North American collaboration?
 - » International collaboration?