Juno mission: some questions people are interested in
Compiled by Paranicas and Zarka
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General discussion of group

Is there energetic particle precipitation of 100s of keV (Are atmospheric models reliable)? Are there MeV potential drops?
Will we see secular variations of the magnetic field?
Will we see a polar cap with open field lines ? Why is there UV emission everywhere at high latitudes?
Is the kink of the oval a longitude or LT effect?
Are Saturn's PPO comparable to system IV?

Ergun

Where is/are the downward current region(s)?
How different are acceleration processes in the Io spots and in the wake?
What is the altitude of the acceleration region above aurora? Satellite footprints?
Are there Double-Layers , Electron/Ion holes in auroral regions? How are they related to Up/Down/Alfvén regions? How interleaved?

Zarka

Heating vs acceleration for producing energetic plasma?
Will JUNO measurements permit us to address Cyclotron Maser microphysics in unexplored regimes (100s keV)?
Does Ganymede interact with Jupiter's B field via reconnection of Alfvén waves?

Badman

How do polar spots evolve?
How does energy of precipitating particles vary?
How do low latitude emissions evolve?
What is the global picture?
What is the role of the solar wind?
How do we identify Io volcanic activity and over what timescales does it affect magnetosphere?

Bunce

Are there PPOs at Jupiter ? Observable?

Allegrini

What is the actual vertical structure of the acceleration region?

Bonfond

What is the size of the polar cap?
How can there be emission on field lines that should connect to the sw (don't see this at other planets)?

Quasi-periodic flares: how can distant regions communicate? Ionosphere modulated? Flares are in phase?
Why are the precipitating electrons so energetic?
Local injections and relationship to auroral signatures

Mauk
X-ray aurora is unique on Jupiter, how/why?
How is the magnetodisc maintained, how are field-aligned fluxes maintained?
What are the energies involved in the aurora; are they really an order of magnitude greater than Earth? Are there analogues between the 2 planets or are they completely different?

Paranicas
How do we incorporate the field-line bend-back into stability models of the disc? Does it make a difference?
Expect to vastly improve our knowledge of the flow vectors at Jupiter. Can we figure out how to map them to the auroral region?
How important are injections at Jupiter and what are their typical scale sizes -- some have been linked to the aurora (e.g., Radioti, Mauk, others).
What is the nature of beams in the magnetosphere (work by Mauk and others)? Where do they originate? Why are the particles very field-aligned far from the planet and more pancake closer to the planet (same at Saturn, Lindau group, Carbary, Clark). Does this mean that there is an important source of energetic particles at very high latitude?
Is there any evidence for heavy mass loading (addition of plasma or neutrals to the magnetosphere) from Europa (e.g., via atmospheric escape)? UV wake? Radio emission?
Can we model the planetary ring current more accurately (energy and radial range, etc.)?

Nichols
What is the source of the various auroras?
Where do the dark regions and various auroras map?
Where is the polar cap; is there one?
What lies behind sw modulation of the main oval?
How does the auroral acceleration process work at Jupiter?
How does f-a current density relate to auroral intensity?
How does the auroral electron energy relate to color ratio?
Do auroras reveal the energy and mass transfer in Jupiter's magnetosphere?
What is the vertical energy deposition profile?
How are the x-ray/UV/vis/IR/radio emissions related? Why?
Why is the north auroral different from the south?
Are auroras key to solving the energy crisis?

Bagenal (from her 2014 SSR paper with some edits/additions)
What is the high latitude structure of the magnetosphere?

Is there reconnection (at high-latitude?) vs small-scale KHI?
Where and how are particles that excite the aurora accelerated?
Where and how is the auroral radio emission generated?
What causes the transient polar aurora?
How much of the planetary field connects to the sw; how does this occur?
What is the size and variability of the polar cap?
How is the main aurora related to magnetospheric dynamics and/or changes in the sw (FRS/FFS)?
What mechanisms accelerate particles to radiation belt energies (injections, w-p, etc.)?
What processes control the structure and dynamics of the radiation belts?
How is the magnetosphere coupled to the sw? What are the mechanisms and quantities of mass and momentum transfer through the magnetopause?
What is the role of coupling of the sw to the magnetosphere in dynamics? How deep does the influence penetrate or is the interaction confined to a boundary layer?
How do the polar regions relate to the long magnetotail observed by Voyager 2 and NH?