

# The Singularity Is Near

## Chapter 6: Impact

NIH BCIG

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Presented by:

Melanie Swan, Futurist

MS Futures Group

650-681-9482

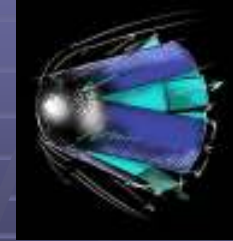
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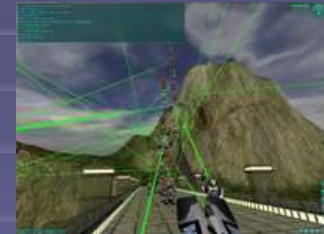
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# Summary



- Impact on the Body, Brain & Longevity
  - Theme: Transition to non-biological experience
  - Billions of body & brain based wireless nanobots
- Impact on Warfare
  - Remote robots, VR, smart dust swarms, nanoweapons & smart weapons
- Impact on Learning, Work & Play
- Impact on the Intelligent Destiny of the Cosmos
  - Drake equation & Fermi paradox, we are probably alone because we would have seen signals of others

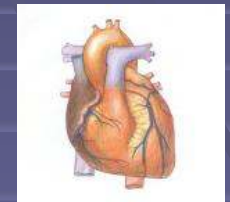




# Human Body 2.0, 3.0



- Redesign, the digestive system is rebuilt
  - Auto-nourishment via clothing
  - Nanobots go in and out of the skin cycling nutrients and waste
  - Digestive system and blood based nanobots supply the precise nutrients needed
  - Eating becomes like sex, no biological impact, just for fun



- Redesign, the heart is optional
  - Obsolete organs, heart, lungs, blood; nanobots delivering oxygen to the cells, don't require liquid-based medium
- At this stage, all but upper esophagus, mouth & brain are left together with the skin, muscle, skeleton & their corresponding parts of the nervous system





# Cyborg Brain

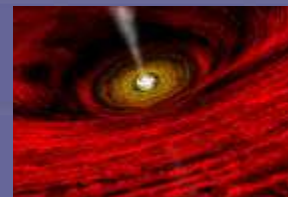


- Nanobots in close proximity to every sensory interneuronal connection
- In-brain nanobots regulate physical functions, serve as personal assistants (download new knowledge and skills) and provide continuous high-bandwidth connectivity and VR
- VR expands awareness and identity
  - Identity: become someone else, palette of personalities, overlays
  - Plug into someone else's sensory-emotional beam and feel what its like to be them. (Education/Diplomacy/Entertainment Apps galore)
- **Cyborg: Humans must physically interface with technology**
  - Biologic human thinking is limited and non-biological intelligence will predominate
    - 1. interface/integrate 2. software-based humans, mind files
  - New biological/non-biological hybrid networks created, completely non-biological networks created, interface with non-biological networks



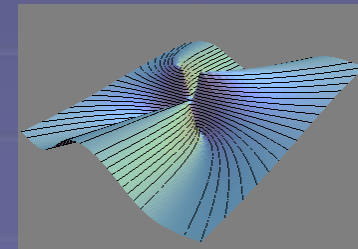
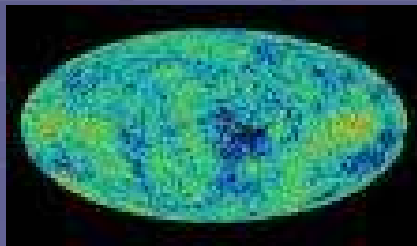
# Impact on the Intelligent Destiny of the Cosmos / Fermi paradox

- Kardashev II 100-200 years after radio
- Goal of intelligence expand compute capability
  - Galaxy colonization speed at close to Light Travel
- Limits of computation
  - One human  $10^{16}$  calculations per second, all humans  $10^{26}$
  - The ultimate cold laptop  $10^{42}$  -  $10^{50}$
  - Earth-sized Zeus machine  $10^{25}$  -  $10^{61}$
  - Solar System  $10^{80}$  computational capacity
  - Universe-scale computer  $10^{90}$  (if holographic,  $10^{120}$ )
  - **Exponential growth of computation to hit a wall during 22<sup>nd</sup> c**
- To keep expanding, intelligence refashions physics
  - Overcome c: adjust the speed, use/create wormholes/otherwise create/move to other universes; overcome gravity; use black holes as the ultimate computer





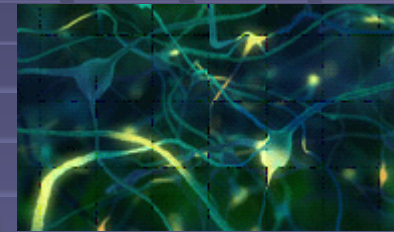
# Dialogue Questions



# Dialogue: Would you try Nanobot Neural Implants?



- “I would if...”
- Dimensions of consideration
  - Clear benefit, low risk/cost
  - Physical and mental fidelity
  - Control
  - Reversibility
  - Legal, economic domains
- What functionality would you want from implants?
- Will neural implants augment humans enough to compete/interact with fully non-biological intelligences?
- Would you take the next step, becoming a software-based human?
- Would you like multiple instances of yourself?





# Dialogue: Terrestrial future

- Software-based humans, mind file
  - How much of yourself would you upload to a mind file?
  - Is it really “me,” the same experience, personality?
- Is there something fundamental about the body that would be lost in software-based humans?
- How will the definition of what is human expand?
- Will VR, 3.0 Human bodies and MNT-based manufacturing technologies trigger office building obsolescence and further dramatic reorganization of the physical world?
- How likely is human lifespan likely to exceed 150? (ignoring uploading)







# Dialogue: Extending Intelligence in the Universe

- Will intelligence saturate?
  - What happens at the end of the double exponentiating computation curve?
  - What if intelligence cannot continue expanding?
- Could we really be alone?
  - Is it most likely that any other ETI/ Kardashev societies have moved into / created new universes?
- Will we be able to set the physical laws and constants in new universes or can we move intelligence into them more directly?

