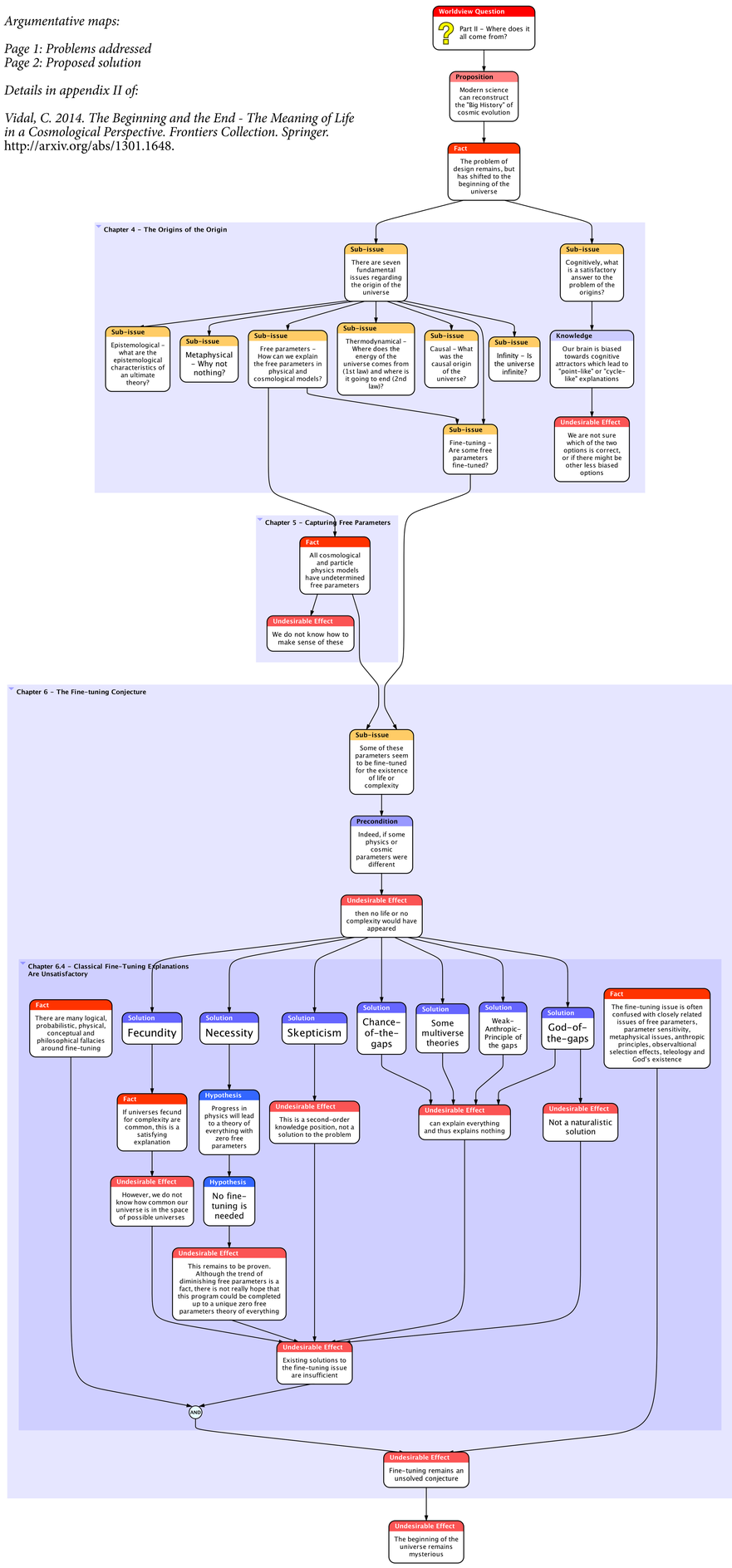
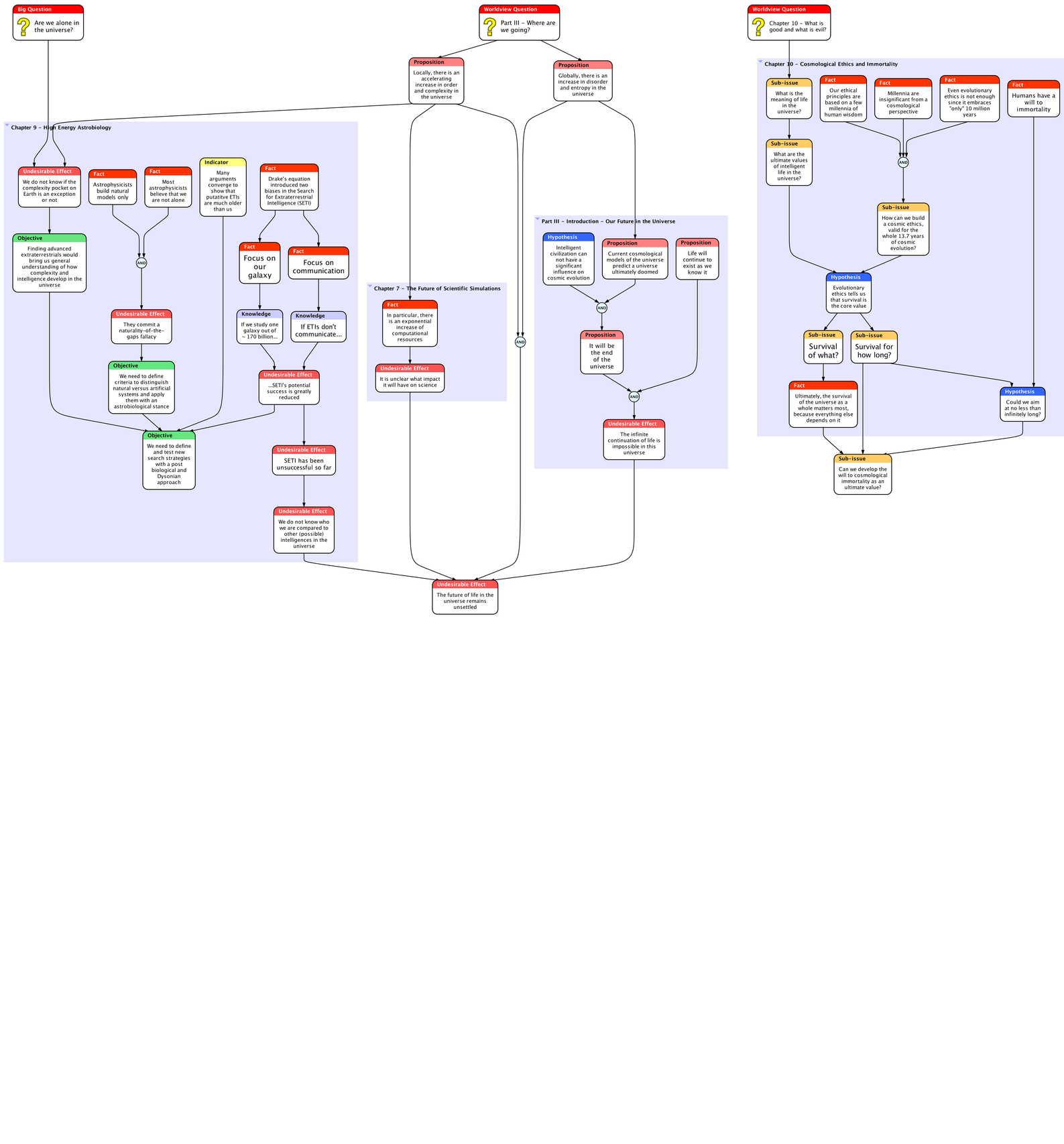
Argumentative maps:

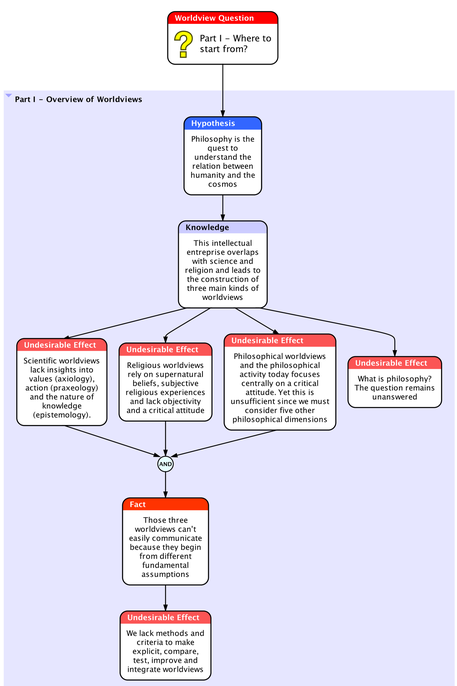
Page 1: Problems addressed
Page 2: Proposed solution

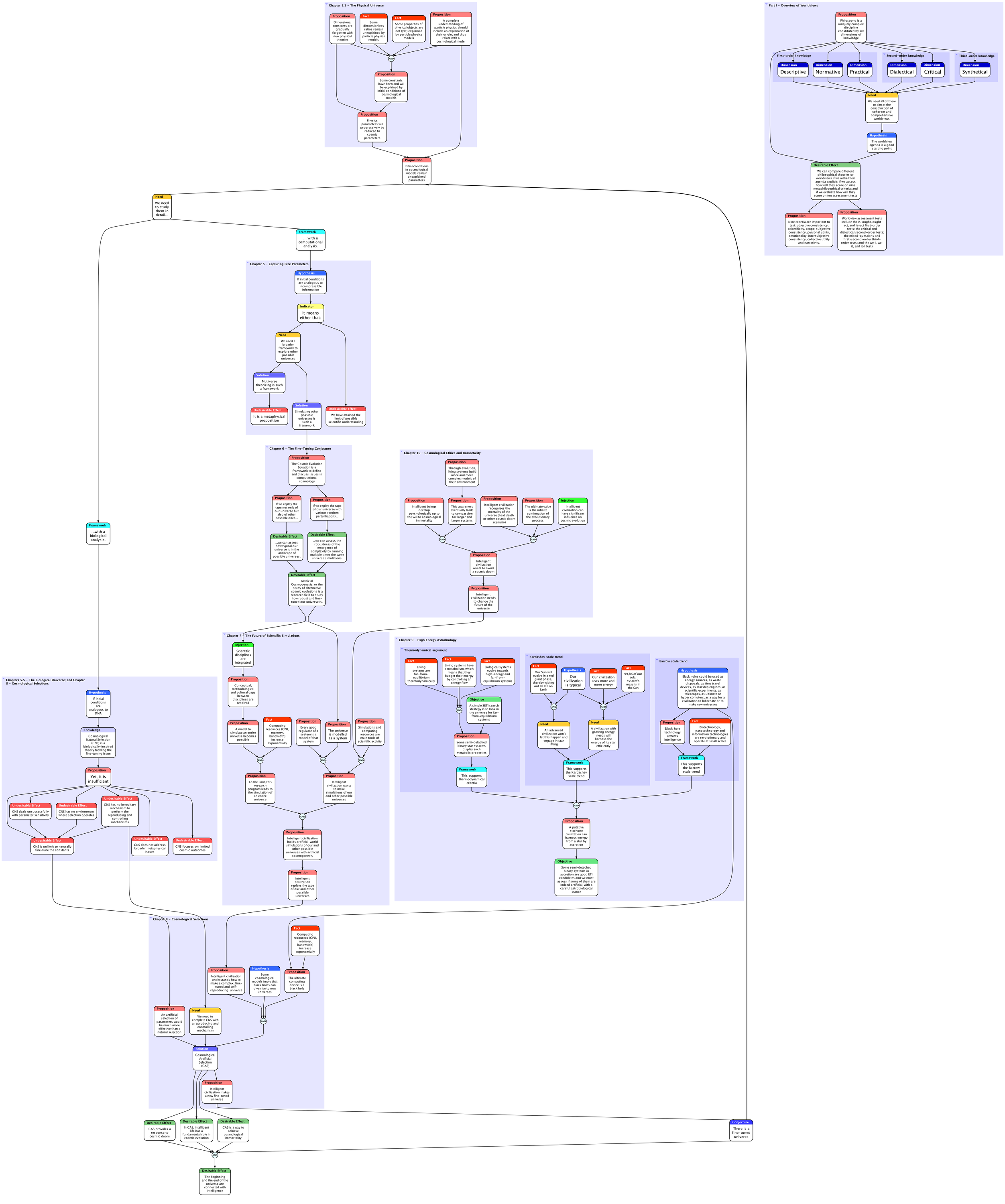
Details in appendix II of:

Vidal, C. 2014. The Beginning and the End - The Meaning of Life in a Cosmological Perspective. Frontiers Collection. Springer. http://arxiv.org/abs/1301.1648.








Part I – Overview of Worldviews
Proposition
Philosophy is a uniquely complex discipline constituted by six dimensions of knowledge
First-order knowledge
Dimension
Descriptive
Dimension
Normative
Dimension
Practical
Second-order knowledge
Dimension
Dialectical
Dimension
Critical
Third-order knowledge
Dimension
Synthetical
Need
We need all of them to aim at the construction of coherent and comprehensive worldviews
Hypothesis
The worldview agenda is a good starting point
Desirable Effect
We can compare different philosophical theories or worldviews if we make their agenda explicit; if we assess how well they score on nine metaphilosophical criteria; and if we evaluate how well they score on ten assessment tests
Proposition
Nine criteria are important to test: objective consistency, scientificity, scope; subjective consistency, personal utility, emotionality; intersubjective consistency, collective utility and narrativity.
Proposition
Worldview assessment tests include the is–ought, ought–act, and is–act first–order tests; the critical and dialectical second–order tests; the mixed–questions and first–second–order third–order tests; and the we–I, we–it, and it–I tests
Chapter 5.1 – The Physical Universe
Proposition
Dimensional constants are gradually forgotten with new physical theories
Fact
Some dimensionless ratios remain unexplained by particle physics models
Fact
Some properties of physical objects are not (yet) explained by particle physics models
Proposition
A complete understanding of particle physics should include an explanation of their origin, and thus relate with a cosmological model
AND
Proposition
Some constants have been and will be explained by initial conditions of cosmological models
Proposition
Physics parameters will progressively be reduced to cosmic parameters
Proposition
Initial conditions in cosmological models remain unexplained parameters
Need
We need to study them in detail...
Framework
...with a computational analysis.
Chapter 5 – Capturing Free Parameters
Hypothesis
If initial conditions are analogous to incompressible information
Indicator
It means either that:
Need
We need a broader framework to explore other possible universes
Solution
Mutliverse theorizing is such a framework
Undesirable Effect
It is a metaphysical proposition
Solution
Simulating other possible universes is such a framework
Undesirable Effect
We have attained the limit of possible scientific understanding
Chapter 6 – The Fine-Tuning Conjecture
Proposition
The Cosmic Evolution Equation is a framework to define and discuss issues in computational cosmology
Proposition
If we replay the tape not only of our universe but also of other possible ones...
Proposition
If we replay the tape of our universe with various random perturbations...
Desirable Effect
...we can assess how typical our universe is in the landscape of possible universes.
Desirable Effect
...we can assess the robustness of the emergence of complexity by running multiple times the same universe simulations.
Desirable Effect
Artificial Cosmogenesis, or the study of alternative cosmic evolutions is a research field to study how robust and fine-tuned our universe is.
Chapter 10 – Cosmological Ethics and Immortality
Proposition
Through evolution, living systems build more and more complex models of their environment
Proposition
Intelligent beings develop psychologically up to the will to cosmological immortality
Proposition
This awareness eventually leads to compassion for larger and larger systems
Proposition
Intelligent civilization recognizes the mortality of the universe (heat death or other cosmic doom scenario)
Proposition
The ultimate value is the infinite continuation of the evolutionary process
Injection
Intelligent civilization can have significant influence on cosmic evolution
AND
AND
Proposition
Intelligent civilization wants to avoid a cosmic doom
Proposition
Intelligent civilization needs to change the future of the universe
Framework
...with a biological analysis.
Chapter 7 – The Future of Scientific Simulations
Injection
Scientific disciplines are integrated
Proposition
Conceptual, methodological and cultural gaps between disciplines are resolved
Proposition
A model to simulate an entire universe becomes possible
Fact
Computing resources (CPU, memory, bandwidth) increase exponentially
Proposition
Every good regulator of a system is a model of that system
Proposition
The universe is modelled as a system
Proposition
Simulations and computing resources are main tools of scientific activity
AND
AND
AND
Proposition
To the limit, this research program leads to the simulation of an entire universe
Proposition
Intelligent civilization wants to make simulations of our and other possible universes
AND
Proposition
Intelligent civilization builds artificial-world simulations of our and other possible universes with artificial cosmogenesis
Proposition
Intelligent civilization replays the tape of our and other possible universes
Chapter 9 – High Energy Astrobiology
Thermodynamical argument
Fact
Living systems are far-from-equilibrium thermodynamically
Fact
Living systems have a metabolism, which means that they budget their energy by controlling an energy flow
Fact
Biological systems evolve towards high-energy and far-from-equilibrium systems
AND
Objective
A simple SETI search strategy is to look in the universe for far-from-equilibrium systems
Proposition
Some semi-detached binary star systems display such metabolic properties
Framework
This supports thermodynamical criteria
Kardashev scale trend
Fact
Our Sun will evolve in a red giant phase, thereby wiping out all life on Earth
Hypothesis
Our civilization is typical
Fact
Our civilization uses more and more energy
Fact
99,8% of our solar system's mass is in the Sun
AND
AND
Need
An advanced civilization won't let this happen and engage in star lifting
Need
A civilization with growing energy needs will harness the energy of its star efficiently
Framework
This supports the Kardashev scale trend
Barrow scale trend
Hypothesis
Black holes could be used as energy sources, as waste disposals, as time travel devices, as starship engines, as scientific experiments, as telescopes, as ultimate or hyper comuters, as a way for a civilization to hibernate or to make new universes
Proposition
Black hole technology attracts intelligence
Fact
Biotechnology, nanotechnology and information technologies are revolutionary and operate at small scales
Framework
This supports the Barrow scale trend
AND
Proposition
A putative starivore civilization can harness energy from a star by accretion
Objective
Some semi-detached binary systems in accretion are good ETI candidates and we must assess if some of them are indeed artificial, with a careful astrobiological stance
Chapters 5.5 – The Biological Universe; and Chapter 8 – Cosmological Selections
Hypothesis
If initial conditions are analogous to DNA
Knowledge
Cosmological Natural Selection (CNS) is a biologically-inspired theory tackling the fine-tuning issue
Proposition
Yet, it is insufficient
Undesirable Effect
CNS deals unsuccessfully with parameter sensitivity
Undesirable Effect
CNS has no environment where selection operates
Undesirable Effect
CNS has no hereditary mechanism to perform the reproducing and controlling mechanisms
Undesirable Effect
CNS is unlikely to naturally fine-tune the constants
Undesirable Effect
CNS does not address broader metaphysical issues
Undesirable Effect
CNS focuses on limited cosmic outcomes
Chapter 8 – Cosmological Selections
Fact
Computing resources (CPU, memory, bandwidth) increase exponentially
Proposition
Intelligent civilization understands how to make a complex, fine-tuned and self-reproducing universe
Hypothesis
Some cosmological models imply that black holes can give rise to new universes
Proposition
The ultimate computing device is a black hole
Proposition
An artificial selection of parameters would be much more effective than a natural selection
Need
We need to complete CNS with a reproducing and controlling mechanism
AND
Solution
Cosmological Artificial Selection (CAS)
Proposition
Intelligent civilization makes a new fine-tuned universe
Desirable Effect
CAS provides a response to cosmic doom
Desirable Effect
In CAS, intelligent life has a fundamental role in cosmic evolution
Desirable Effect
CAS is a way to achieve cosmological immortality
Conjecture
There is a fine-tuned universe
AND
Desirable Effect
The beginning and the end of the universe are connected with intelligence