

## Advanced Track, Overview Site Summary

This Advanced Track provides a technical supplement to the introductory web site on cosmic evolution, produced by Eric Chaisson and based on courses taught mainly at Harvard University for the past few decades:

[http://www.cfa.harvard.edu/~ejchaisson/cosmic\\_evolution/docs/splash.html](http://www.cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/splash.html)

Currently, this Advanced Track is abbreviated while addressing mainly the concept of energy rate density—a numerical quantity proposed as a useful complexity metric for an underlying, unifying process that guides the origin, evolution, and destiny of all organized systems across the arrow of time, from big bang to humankind. In 2015, this supplement will grow dramatically, providing much more pertinent technical material at an advanced, quantitative level (suitable for colleague scientists and graduate students) well beyond that presented in the above-linked introductory web site (which is meant for non-scientists and beginning students).

Further material related to the subject of cosmic evolution is available at:

<http://www.cfa.harvard.edu/~ejchaisson>

including a collection of recent research papers easily accessed and downloadable at:

[http://www.cfa.harvard.edu/~ejchaisson/current\\_research.pdf](http://www.cfa.harvard.edu/~ejchaisson/current_research.pdf)

### Some representative, relevant publications:

Chaisson, E.J., *Cosmic Evolution: Rise of Complexity in Nature*, Harvard University Press, Cambridge, 2001.

Chaisson, E.J., "Unifying Concept for Astrobiology," *Int. J. Astrobio*, v2, p91, 2003; DOI:10.1017/S1473550403001484

Chaisson, E.J., "Cosmic Evolution: State of the Science," in *Cosmos & Culture*, Dick & Lupisella (eds), NASA Press, 2009.

Chaisson, E.J., "Exobiology and Complexity," in *Encyclopedia of Complexity & Systems Science*, Meyers (ed.), Springer, 2009.

Chaisson, E.J., "Energy Rate Density as a Complexity Metric and Evolutionary Driver," *Complexity*, v16, p27, 2011; DOI:10.1002/cplx.20323

Chaisson, E.J., "Energy Rate Density. II. Probing Further a New Complexity Metric," *Complexity*, v17, p44, 2011; DOI:10.1002/cplx.20373

Chaisson, E.J., "Using Complexity Science to Search for Unity in the Natural Sciences", in *Complexity and the Arrow of Time* Lineweaver et al. (eds.), Cambridge University Press, 2013.

Chaisson, E.J., "A Singular Universe of Many Singularities: Cultural Evolution in a Cosmic Context", in *Singularity Hypotheses: A Scientific and Philosophical Assessment*, Eden, et al., (eds.), The Frontiers Collection, Springer, Berlin, 2013.

YOUTUBE postings from Moscow and Cambridge, 2012:

<http://www.youtube.com/watch?v=jbXzmpWCMIM>

<http://www.youtube.com/watch?v=ChAmeRD3b-I>

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