

# IDH 3931 - Prof. Eikenberry

## The Extreme Cosmos

### Syllabus for Fall 2018

- **Instructor:** Prof. Stephen Eikenberry
- **Web site:** [www.astro.ufl.edu/~eiken/teaching.html](http://www.astro.ufl.edu/~eiken/teaching.html)
- **Text:** Assigned readings weekly

**Class meetings:** Wed 9 (4:05-4:55 PM)  
Little Hall, Rm 119

**Office hours:** By appointment

The Universe hosts a broad range of physical environments and phenomena. In the most extreme conditions, events and behaviors there can challenge our current understanding of the laws of Nature. In this 1-credit discussion-based Honors course, we will take an overview of some of the most extreme physical environments in the cosmos - some of which are in our own astrophysical "back yard". We will cover phenomena ranging from supernovae and gamma-ray bursts, to merging black holes, to Dark Matter and Dark Energy. Assignments will consist of weekly readings before class, with in-class activities focused on discussing the phenomena and their implications for our understanding of the Universe. While the course will be largely non-mathematical in its approach, some previous exposure to physics and mathematics at the college level will be required to facilitate the discussions.

#### **Course goals:**

The goal of this course is to provide a survey of the extreme astrophysical environments and phenomena in the Universe, and their potential implications for humanity.

#### **Requirements:**

1. **Assigned reading prior to class**
2. **Class participation in discussions (60% of grade)**
3. **Short topical paper due on the last day of class (40% of grade)**

## Grading:

Given the above scoring (total of 100 points), the following grades will be assigned:

<b>Grade</b>	<b>Minimum Score</b>
A	93
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
D+	67
D	63
D-	60

UF's grading policy, including calculation of grade points and GPA is available at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## Contact Info:

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## Policy Items:

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

## Lecture Schedule – The Extreme Cosmos – Fall 2018

**12 August 2018 – Subject to Updates!**

Date	Topic	Reading
22 Aug 2018	Introduction; Syllabus Review	Syllabus
29 Aug 2018	Extreme in Our Backyard: The Sun	<a href="http://www.thesuntoday.org/">http://www.thesuntoday.org/</a> - read all 6 subtabs of “The Sun” and “Space Weather”; also <a href="https://en.wikipedia.org/wiki/Maunder_Minimum">https://en.wikipedia.org/wiki/Maunder_Minimum</a>
05 Sep 2018	Massive Stars: The Bigger They Are ...	<a href="https://www.space.com/41313-most-massive-star.html">https://www.space.com/41313-most-massive-star.html</a> ; <a href="https://www.skyandtelescope.com/astronomy-news/the-most-massive-star/">https://www.skyandtelescope.com/astronomy-news/the-most-massive-star/</a> ; <a href="https://science.nasa.gov/astrophysics/focus-areas/how-do-stars-form-and-evolve">https://science.nasa.gov/astrophysics/focus-areas/how-do-stars-form-and-evolve</a> ; <a href="https://www.education.psu.edu/astro801/content/l6_p5.html">https://www.education.psu.edu/astro801/content/l6_p5.html</a>
12 Sep 2018	Supernovae Type II: Big Star Go Boom	<a href="https://www.space.com/6638-supernova.html">https://www.space.com/6638-supernova.html</a> ; <a href="https://en.wikipedia.org/wiki/SN_1987A">https://en.wikipedia.org/wiki/SN_1987A</a> ; <a href="http://heritage.stsci.edu/1999/04/sn1987anino.html">http://heritage.stsci.edu/1999/04/sn1987anino.html</a>
19 Sep 2018	Neutron Stars	
26 Sep 2018	Pulsars:	
03 Oct 2018	Black Holes: A Hole in Space & Time	
10 Oct 2018	Jets, Wormholes, Time Travel	
17 Oct 2018	The Big Bang	
24 Oct 2018	Gamma-Ray Bursts & Hypernovae	
31 Oct 2018	Gravitational Waves: Ripples in Spacetime	
07 Nov 2018	Binary Neutron Star Mergers	
14 Nov 2018	Neutrino Astronomy	
21 Nov 2018	THANKSGIVING – UF Holiday	
28 Nov 2018	Dark Matter	
05 Dec 2018	Dark Energy	