

Session 1 – Introduction

Welcome to F402, Time Travel in Science Fiction. The objective of this course is to help you to read, understand and enjoy stories in the genre. The course is in two parts; the first is Today's lecture and discussion on the genre while the second is class discussions of two stories of opposite types. [click](#) The reading assignment consists of a short story, *All You Zombies*, [click](#) and a novel, *1632*, both of which are available online from links in the handout. [click](#) For the convenience of those who prefer dead trees, I have listed a number of anthologies¹ containing *All You Zombies*. [Reading Assignment for Sessions 2-3](#) [click](#) *All You Zombies* is one of two tour de force stories by Robert A. Heinlein that left their mark on the genre for decades. Please read *All You Zombies* prior to the next session [click](#) and *1632* [click](#) [click](#) Part One, chapters 1-14 prior to the third session. [Esc](#) **Session 1** Keep in mind that science fiction is a branch of literature, so the normal criteria of, e.g., characterization, consistency, continuity, plot structure, style, apply; I welcome comments, especially from those who have expertise in those areas. In addition, while a science fiction author must rely on the willing suspension of disbelief, he should do so sparingly. There is a lapse of continuity in *1632* between chapters 8 and 9; see whether you can spot it. I will suggest specific discussion points to start each discussion, but please bring up any other issues that you believe to be important or interesting.

You may wish to read and discuss some of the other stories in the timeline. I recommend the following, but there are many other good stories:

¹Included in
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The Best of Robert Heinlein
The Fantasies of Robert A. Heinlein
The Golden Years
The Unpleasant Profession of Jonathan Hoag
Timescapes: Stories of Time Travel
Time Travelers: Fiction in the Fourth Dimension
The Fantasies of Robert A. Heinlein

Magazine	Issue	Date	Pages	Author	Title
Galaxy	Vol 1, No. 4	January 1951	66-73	Mack Reynolds Fredick Brown	<i>Dark Interlude</i>
Galaxy	Vol 1, No. 5	February 1951	62-74	Lester del Ray	<i>And it comes out here</i>
Galaxy	Vol. 2, No 3	June 1951	56-93	Damon Knight	<i>Don't Live in the Past</i>
Galaxy	Vol. 16, No. 4	August 1958	63-72	Charles Satterfield	Third Offense

I have prepared remarks on docstore, but be warned that I intend to deviate from them from time to time.

The main handout is a copy of the slides that I will be presenting; if you view [Slides: Portrait \[ODP, PDF\]](#) and [Landscape \[ODP, PDF\]](#) in Docstore, you will see some click-able links to other material. Similarly, the list of authors and the publication timeline linked to from the slides themselves contain links; for those stories available online, I have included links either from the title or from the publication date. If you don't have access to LibreOffice, OpenOffice or PowerPoint, you can access the PDF versions of the portrait and landscape slides.

I will not follow the handouts exactly, but will occasionally skip forward when two topics are related, and may deviate from my planned presentation in response to your questions. While I am providing links to material in wikipedia, I am neither covering all of the authors, stories and topics listed in those articles nor restricting myself to those authors, stories and topics. Also, the handouts will not include the technical papers that I mention; any student who wishes more details should consult [Notes \[ODT, PDF\]](#) in Docstore. Finally, I would prefer that you ask questions as they occur rather than waiting until the end of the session, but not while I am playing audio or video recordings.

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Scope

For purposes of this class, the genre consists of stories that rely on the

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bidirectional transfer in time [click](#) of matter or information by natural means, whether fortuitous or by design. [click](#) This rules out stories relying only on, e.g., the supernatural, long sleeps, time dilation. It also rules out alternate universe stories not involving time travel as the splitting mechanism. [Click click](#)

Category

Time travel stories fall into two broad classes; those in which time is immutable, which I refer to as the space-time view, [click](#) and those in which time is mutable. [click](#)

History of genre

The antecedents to the modern time travel story go back to antiquity, with prophetic dreams in Genesis and the stories concerning the Oracle at Delphi, in which attempts to evade a prophecy resulted in its fulfillment. [click](#) The most notable of these is the myth of Oedipus, [click](#) which inspired Sophocles to write *Oedipus Rex*, [click](#) which in turn inspired Tom Lehrer to write his comic song *Oedipus Rex*²³. I will now play that song for a comic break. [Lyrics play handout.odp](#)

Note that while these stories are not time travel stories, they contain one of the recurring themes, the Predestination Paradox. Similarly, there are time travel fantasies that are not science fiction but that are nonetheless relevant to the history of the genre. [click](#)

As literacy became more common and printing less expensive, a number of authors wrote stories that relied on ad hoc hand-waving to explain the time travel; these included blows on the head, lightning strikes and prophetic dreams. [click](#) Probably the most well known of these early stories is Samuel Clemens's *A Connecticut Yankee in*

²Lyrics at <http://www.lyricsfreak.com/t/tom+lehrer/oedipus+rex_20138385.html>

³Recording at <<http://www.youtube.com/watch?v=mScdJURKGWM>>

King Arthur's Court. [click](#)

Late in the 19th Century authors began writing stories that relied on pseudo-scientific hand waving and techno-babble. The earliest familiar example is H. G. Wells's *The Time Machine*. This type of story remained common late into the 20th Century, [click](#) but became less common compared to stories that appealed to new Physics. [click](#)

Albert Einstein's theory of Special Relativity implies that travel faster than light (FTL) is equivalent to time travel. There were a number of stories in the second half of the 20th Century that relied on that fact, notably James Blish's *Beep*, which employs a fictional Dirac radio that sends messages instantaneously. After Gerald Feinberg introduced the term Tachyon in 1967, authors began using them in their stories, e.g., Greg Benford's *Timescape*. [click](#)

For half of the 20th Century Physicists believed that time travel was impossible, but in 1949 Kurt Gödel published *An example of a new type of cosmological solution of Einstein's field equations of gravitation*, describing a space-time with closed timelike curves, and in 1974 Frank Jennings Tipler⁴ published *Rotating Cylinders and the Possibility of Global Causality Violation*⁵, which appeared to show a means to actually construct a time machine⁶. After that physicists were more open to the possibilities of time travel, and science fiction authors began using mechanisms allowed in General relativity, e.g., Tipler cylinders, wormholes. Some of the stories exploiting GR, e.g., Dr. Robert Forward's *Timemaster*, were actually written by physicists.

Representative authors and stories

[Authors.html](#) The handout lists several authors who have written time travel stories; some of them are important, some are personal favorites and some

⁴Dr. Tipler was not the first to discover his solution to the field equations, but Kornel Lanczos in 1924) and Willem Jacob van Stockum in 1936 did not recognize that their solutions allowed time travel.

⁵Rotating Cylinders and the Possibility of Global Causality Violation, Physical Review D 9 (8): 2203-2206. Bibcode:1974PhRvD...9.2203T. doi:10.1103/PhysRevD.9.2203. See also his 1976 PhD. thesis at the University of Maryland, College Park, *Causality Violation in General Relativity*.

⁶Later researcher discovered that actually building a Tipler cylinder would require exotic matter.

are there because I refer to them elsewhere; long time readers of Science Fiction should recognize most of them. [Timeline.html](#) There is also a timeline showing when various stories were published [handout click](#) and a list of time-travel movies that you may be familiar with; where a movie or TV episode was based on a printed story, I list only the printed story unless the movie is well known. At this time I would encourage you to mention any time-travel authors or stories that you enjoy and to explain why. [click](#)

Mechanism

I've mentioned several mechanisms while discussing the history of the genre. [click](#) The most promising, involving Special and General Relativity, have some limitations. [click](#)

If Tachyons exist, using them for communications presents several obstacles that I've never seen mentioned in any stories based on them. If they are charged, they would lose energy due to Cerenkov radiation, while if they are uncharged, they would be harder to detect. [click](#)

All of the known means of exploiting General Relativity for time travel [click](#) [click](#) [click](#) are limited to the period after the time machine has been constructed. That still leaves an author a lot of scope, but is frustrating. [click](#)

Issues

There are a couple of issues that stories not using GR typically fail to address. One is the question of subjective time. If the trip does not appear to be instantaneous, how can a character feel a flow of time unrelated to the time that he is traveling through? [click](#) The second issue is that instantaneous jumps in space or time would appear to violate conservation of energy and momentum. Neither of these issues apply to time travel using mechanisms consistent with GR. [click](#)

Tropes

There are a number of themes common in time travel stories.

Some authors postulate that while time is mutable, there is a physical principal damping out attempted changes, so that it takes an immense amount of effort to make a substantive change. [click](#)

Time travel opens up legal issues, both as to the interpretation of existing laws, e.g., statutes of limitation, and as to what new laws might be passed, e.g., limitation on who may travel to the past and under what conditions he may do so. [click](#)

A number of stories describe some sort of meddling, where an individual, group or entire society wants to change the past in order to bring about a future more to its liking, as in Isaac Asimov's *The End of Eternity*. [click](#) Such stories sometimes have groups with competing agenda fighting a time war, e.g., Jack Williamson's *The Legion of Time*, Fritz Leiber's *The Big Time*. Sometimes, as in the movie *Back to the Future*, the meddling is intended to undo unintended changes to the time line. [click](#)

A number of authors describe various paradoxes, e.g., the bootstrap paradox, the grandfather paradox, most of which are consequences of the space-time view and do not occur in stories based on mutable time. An early story that discussed temporal paradoxes was Thomas Anstey Guthrie's *Tourmalin's Time Cheques*. [click](#)

In the bootstrap paradox, an event in the present causes an event in the past that in turn causes the original event; In the most prominent example, Robert A. Heinlein's *By His Bootstraps*, Bob Wilson meets, argues with and fights with a number of characters, all of whom turn out to be himself. In the related Predestination Paradox, any attempt to use knowledge of the future to change the past must fail; Jack Williamson's *After World's End* is an example. [click](#)

In the grandfather paradox, a character attempts to go back into the past and kill one of his ancestors. According to wikipedia, the idea was first published in René Barjavel's 1943 novel *Le voyageur imprudent*

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(*The imprudent traveler*); however, in *Time Travel Literature* John L. Flynn attributes it to Nathaniel Schachner's 1933 short story *Ancestral Voices*. [click](#)

A number of stories describe the operators of time machines keeping them secret either from their own society or from the eras to which they travel. In some stories this secrecy is required by law. [click](#)

A number of stories depict time travelers who are stranded, usually in the past, and describe their efforts to cope with an unfamiliar environment; in L. Sprague de Camp's *Lest Darkness Fall*, Martin Padway is stranded in 6th century Rome and introduces modern technology in an attempt to avert its collapse. *1632*, the novel that we will be discussing, is of that type. There might be problems learning the local mores, finding food, resources and shelter, defending against or evading hostile armies, learning local languages, or finding jobs in an era where their skills are inappropriate.

Similarly, some stories make the point that the “good old days” were nasty and brutish; even in a short trip to the past you could be injured or die if you were careless or just unlucky. L. Sprague de Camp's *A Gun for Dinosaur* is a good example, as well as an example of the Predestination Paradox. Some stories, e.g., Charles Satterfield's⁷ *Third Offense*, describe a penal system in which criminals are stranded in the past to serve their sentences. In some stories, temporal chauvinism causes characters to underestimate down-timers and to overestimate their own capabilities. [click](#)

A number of stories describe time police, protecting time travelers and enforcing laws regarding their conduct in the past. Often these stories portray the leadership of the time police violating the very rules that their underlings are told to enforce, or have hidden agenda; Poul Anderson's *Time Patrol* is an example. [click](#)

Some stories depict exploitation of the past, e.g., trade between

⁷Actually a pen name for Frederik Pohl and Lester del Ray.

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different eras, usually with the people in the earlier era unaware that they are trading with the future. One common theme is recruiting personnel for military and police organizations. [click](#)

References

The handout includes a list of references. If you read the handouts from Docstore, then you can simply click on the link; otherwise, type the URL into your browser or, for wiki articles, type the article name into the search block at <http://en.wikipedia.org>.

Closing

At this time, I encourage you to ask questions about time travel authors, issues and stories, including both clarifications of material that I have covered and new material. If time allows, I will play an audio recording of *All You Zombies*; otherwise I will play it in Session 2.

Session 2 - All You Zombies

The worm Ouroboros mentioned in the story and portrayed in the handouts is emblematic of the bootstrap paradox.

Prior to the discussion, I will play (an audio recording of All you zombies and) a short movie version of *All You Zombies*. The movie uses legos rather than actors, but sticks fairly closely to the story.

I will now play the song *I'm My Own Grandpa*⁸⁹ for a comic break. If you wish I will play an alternate movie version of *All You Zombies* that takes some liberties with the plot.

At this time I am opening the floor for discussion of *All You Zombies*.

⁸Lyrics at <http://gean.wvco.com/grandpa/>

⁹Audio at <https://archive.org/details/ImMyOwnGrandpa;play>

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What do you think of the action? The characterization? Was the sequence of events plausible? Did you see it coming? Was the behavior of the characters plausible? Did you notice any discrepancies between the story and the movies?

Next week we will discuss *1632* Parts One-Four, chapters 1-44. Meanwhile, I leave you with this bit of whimsy. [click](#)

Session 3 - 1632 Parts 1-4

Eric Flint set *1632* in the middle of the Thirty Years' War, a particularly nasty venue. In doing so, he provided ample scope for adversity, betrayal, conflict, danger and hardship. In choosing to have Grantville be the size of Mannington instead of a larger city, he made some problems easier and others harder. I will not be discussing other stories in the series, but if you have read them you may want to bring up issues that they raise.

The discussion points in the handouts are only suggestions. There is one set that I will repeat at each session, and also a set specific to each session. At this time I am opening the floor to a discussion of *1632* Parts One-Four, chapters 1-44. [click](#) What do you think of the action? [click](#) The characterization? [click](#) Was the behavior of the characters plausible? [click](#) Was the behavior of the characters appropriate? [click](#) Was the depiction of historical characters accurate? [click](#) How did the size of Grantville affect events? [click](#)

Specific discussion points for Part One:

- Initial reaction to the ring of fire [click](#)
- Battles at farmhouse [click](#)
- Rebecca's reactions [click](#)
- Mike's reactions [click](#)
- Town meeting [click](#)
- Cabinet meeting [click](#)

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- Lapse of continuity between chapters 8 and 9 [click](#)
- Gustavus II Adolphus [click](#)
- Reaction of Mackay's troops [click](#)
- Reaction of Mackay to up-timers [click](#)
- Meetings at the Roth's [click](#)

Specific discussion points for Part Two:

- Camp followers [click](#)
- Battle of the Crapper [click](#)
- Gretchen [click](#)
- Jeff [click](#)
- Melissa [click](#)
- Showers [click](#)
- Cafeteria [click](#)
- Proposal and aftermath [click](#)
- Choosing of the Living [click](#)
- Wedding and family [click](#)

Specific discussion points for parts Three-Four:

- Battle of Breitenfeld [click](#)
- Gretchen Richter [click](#)
- Julie Sims [click](#)
- Alexander Mackay [click](#)

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- Battle of Jena [click](#)
- Committee of Correspondence [click](#)
- Abrabanel family [click](#)
- Diplomatic and political maneuvering [click](#)
- Club 250, Thuringen Gardens and the elections [click](#)

Please read *1632* Parts 5-7, chapters 45-61 prior to the next session.

Session 4 - 1632 Parts 5-7

The discussion points in the handouts are only suggestions. There is one set that I will repeat at each session, and also a set specific to each session. At this time I am opening the floor to a discussion of *1632* Parts 5-7, chapters 45-61. What do you think of the action? [click](#) The characterization? [click](#) Was the behavior of the characters plausible? [click](#) Was the behavior of the characters appropriate? [click](#) Was the depiction of historical characters accurate? [click](#) How did the size of Grantville affect events? [Session 4 Parts Five-Six Discussion Points](#)

Specific discussion points for Session 4 Parts 5-6:

- Diplomatic maneuvering [click](#)
- Nobility [click](#)
- Gustav [click](#)
- Julie [click](#)
- Wartburg [click](#)
- Croat raid [click](#)

Specific discussion points for Part 7:

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- The deal
 - From the perspective of Grantville
 - From Gustav's perspective [click](#)

Eric Flint chose to write about Grantville (based on Mannington), Thuringia and the 17th Century. How did those choices affect the story/ How would the story have played out with other choices?

At this time you may return to previous chapters, or discuss other stories. I encourage you to contrast *All You Zombies* and *1632* with similar stories that you have read.

Before we wrap up, you may wish to continue the discussions from the first session, either to cover issues in more depth or to raise additional issues on the genre.