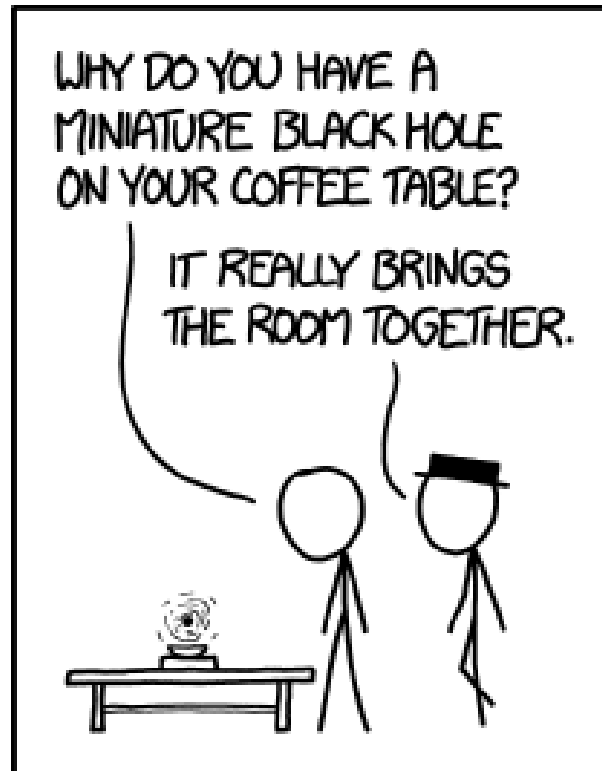


Paper Doodle & Presentation

ASBE fall 2025 – Onno Pols & Lieke van Son



source: xkcd

What is a paper doodle?

In the second half of the course, each student is asked to summarise a paper into a "doodle version", and present the result to the rest of the class.

See example here:

<https://pubs.aip.org/physicstoday/online/42701/Translating-scientific-papers-for-the-public>

- Credit to inventor Claire Lamman

The goal is for you to summarize paragraphs in a way that **captures the bigger picture +** provides helpful imagery

★ Exploding stars tell us the universe is growing really fast

~~OBSERVATIONAL EVIDENCE FROM SUPERNOVAE FOR AN ACCELERATING UNIVERSE
AND A COSMOLOGICAL CONSTANT~~

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PETER M. GARNAVICH,² RON L. GILLILAND,⁵ CRAIG J. HOGAN,⁴ SAURABH JHA,² ROBERT P. KIRSHNER,⁴
B. LEIBUNDGUT,⁶ M. M. PHILLIPS,⁷ DAVID REISS,⁴ BRIAN P. SCHMIDT,^{8,9} ROBERT A. SCHOMMER,⁷
R. CHRIS SMITH,^{7,10} J. SPYROMILIO,⁶ CHRISTOPHER STUBBS,⁴
NICHOLAS B. SUNTZEFF,⁷ AND JOHN TONRY¹¹

This took an entire team

ABSTRACT

We present spectral and photometric observations of 10 Type Ia supernovae (SNe Ia) in the redshift range $0.16 \leq z \leq 0.62$. The luminosity distances of these objects are determined by methods that employ relations between the light curve shape and the luminosity. We observed some supernovae and found them to be farther away than expected. After some very careful statistics, we're pretty confident that there is something extra out there besides just light and matter. Some type of energy... that's dark... It implies that the universe is 14 billion years young. But don't worry, she still has plenty of life ahead of her because our fate is apparently sealed in an eternal expansion.

(The term "dark energy" is not used in this paper. This was settled later after a few iterations – including "funny energy".)

Timeline/ Deadlines

-- Keep an eye out on Brightspace

- Tuesday November 4th:
→ submit your chosen paper through Brightspace for approval
- Monday December 1st (17:00)
→ hand in final version of your **paper doodle**
- Tuesday December 2nd (15:30-17:30)
Paper presentations: 15 min pp

Grading

Both the paper doodle *and* your presentation count towards your final grade for this part of the course.

Together they make up **30% of the final grade.**

Grading will be based on the following criteria:

1. How well you explain *why you picked this paper*, and *why it is relevant*.
2. How well you explain the **main result(s) and conclusion(s)** of the paper (keeping in mind the background knowledge of your fellow students),
3. How well you explain the **connection of these results** to what we learned during the course.
4. If you have successfully **managed to distil your paper into a doodle version**: extra points for creativity (artistic or otherwise).

Potential subjects

Note that the topic of your presentation **should be different from the topic your MESA case study.**

- Evolution of the first stars (population III)
- Evolution of super-AGB stars
- Formation of black holes in stellar core collapse
- Testing stellar evolution theory using binary stars
- Effects of rotation on the evolution of massive stars
- Effects of binary evolution on stellar rotation
- Properties and evolution of contact binaries
- Formation and evolution of blue stragglers
- Binary progenitor evolution towards Type Ia supernovae
- Progenitor evolution of Type Ib/Ic supernovae
- Progenitor evolution of gamma-ray bursts
- Progenitor evolution of binary black hole mergers

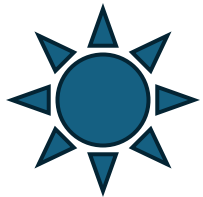
	BLACK HOLE	REGULAR HOLE
USUALLY FORMED BY...	SUPERNOVAS, COLLIDING STARS	SHOVELS, SMALL MAMMALS
FALLING IN IS...	DEFINITELY FATAL	SOMETIMES FATAL
CREATED BY THE BIG BANG	MAYBE	NO
CREATED BY CHILDREN PLAYING AT THE BEACH	I <i>REALLY</i> HOPE NOT	YES
SOURCE OF MANY PRECIOUS METALS	INDIRECTLY	YES
EINSTEIN IMAGINED FALLING INTO ONE	YES	PROBABLY AT LEAST ONCE
A COMPONENT OF DARK MATTER	MAYBE	PROBABLY NOT
CREATED BY THE LARGE HADRON COLLIDER	NO	YES
MASSIVE STARS OFTEN COLLAPSE INTO THEM	YES	NO
EXPLORED BY HUMANS IN FAMOUS SCI-FI STORIES	YES	YES
FATAL TO GET A BIG ONE IN YOUR BODY	YES	YES
SOME OF THEM ARE THE MOUTHS OF WORMHOLES	MAYBE	YES
STEPHEN HAWKING AND KIP THORNE ARGUED THAT ANY INFORMATION THAT FALLS INTO THEM IS LOST FOREVER	YES	NO
COMMONLY INHABITED BY MEERKATS	UNDETERMINED	YES

Bonus points for being creative

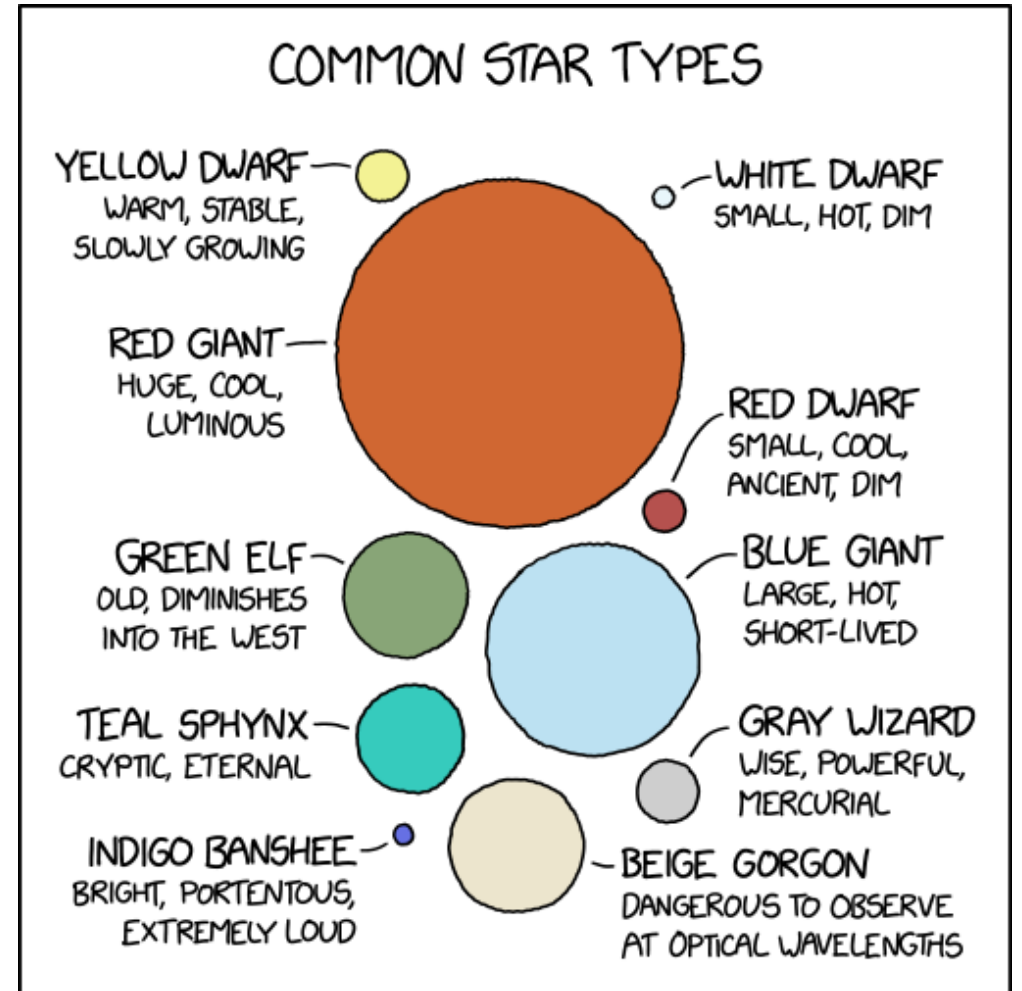
(artistic or otherwise).

*The most important attributes of a vector in 3-space are
{location, location, location}! - XKCD*

Note, it pays off later to become a ppt or
keynote master!



Actual drawing skills are not required



source: xkcd

Required Tools

- **Mostly Power point**

Brightspace > Table of Content > Student presentations

You will find the [paper-summary-template.ppt](#)

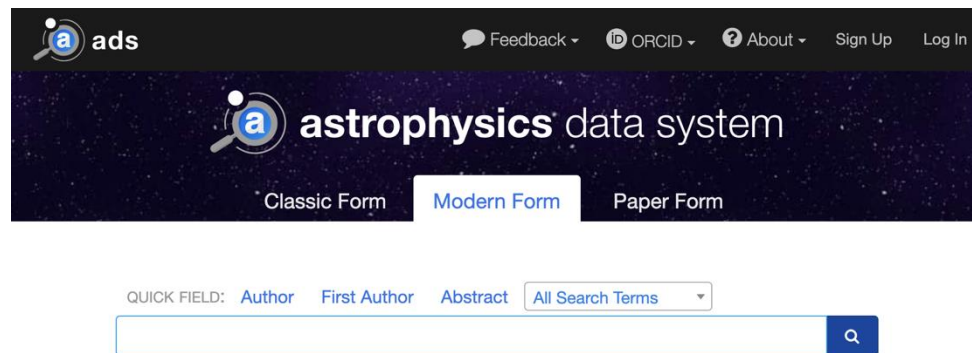
- **You can use different tools to create/ import doodles**

- Easiest if you have a tablet that supports a PowerPoint app (like iPad), then you can directly use ppt under 'Draw'
- Alternatively you can doodle with pen & paper and use a **photo to vector converter** e.g., Adobe Capture, [vectorizer.ai](#), or use Inkscape (Trace Bitmap or Trace pixel art)

Polling time

How to pick the right paper

- Note that we will care *why* you picked a paper
“because it was short”, or “because chat GPT said so” are not good reasons.
Try to understand why a particular paper has contributed to the field
- a good (but definitely **not** the only!) metric to quantify the impact of a paper is the **citation count**
- Use the ADS:
<https://ui.adsabs.harvard.edu/>
- & ArXiv:
<https://arxiv.org/archive/astro-ph>



If you have trouble accessing papers, **try again from the EDU network** or check the arXiv!

How to pick the right paper (cont.)

- “Science” and “Nature” papers are disfavoured: they have an odd format that forces all the main matter & figures to the appendix.
- You should skim multiple papers before making your pick:
 - Search *inside* [review papers](#) on your topic. common review journals
 - [Reviews of Modern Physics](#) (APS Journals) -- bibstem:"RvMP"
 - [Annual Review of Astronomy and Astrophysics \(ARAA\)](#) – bibstem:"ARA&A"
 - [Living Reviews in Relativity](#) (Springer) – bibstem:"LRR"

(e.g., bibstem:"ARA&A" title:"Massive star")

 - Read several [abstracts](#) of interesting event or discovery papers
 - What do other people cite this paper for? (use ‘citations’ link in ADS)

What to ask yourself while reading a paper

- **Abstract:** What's the main result?
- **Introduction:** Why should we care?
- **Methods:** What was actually done? Does this support the results?
- **Results:** What are the main figures? Can you identify the money plot?
- **Discussion/Conclusion:** What does it mean?

No one knows everything...

Note that papers are written for experts by experts.

It is perfectly normal to have to look up some terms!

I TRY NOT TO MAKE FUN OF PEOPLE FOR ADMITTING THEY DON'T KNOW THINGS.

BECAUSE FOR EACH THING "EVERYONE KNOWS" BY THE TIME THEY'RE ADULTS, EVERY DAY THERE ARE, ON AVERAGE, 10,000 PEOPLE IN THE US HEARING ABOUT IT FOR THE FIRST TIME.

FRACTION WHO HAVE HEARD OF IT AT BIRTH = 0%

FRACTION WHO HAVE HEARD OF IT BY 30 $\approx 100\%$

US BIRTH RATE $\approx 4,000,000/\text{year}$

NUMBER HEARING ABOUT IT FOR THE FIRST TIME $\approx 10,000/\text{day}$

IF I MAKE FUN OF PEOPLE, I TRAIN THEM NOT TO TELL ME WHEN THEY HAVE THOSE MOMENTS. AND I MISS OUT ON THE FUN.

"DIET COKE AND MENTOS THING"? WHAT'S THAT?

OH MAN! COME ON, WE'RE GOING TO THE GROCERY STORE.

WHY?

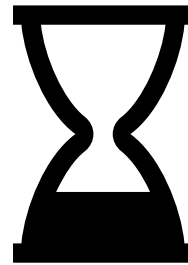
YOU'RE ONE OF TODAY'S LUCKY 10,000.



Time for some practice!

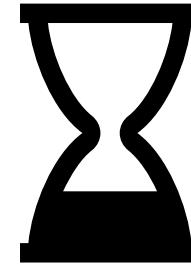
1. Pair up in teams of 2 or 3
2. Pick a paper from the ArXiv (<https://arxiv.org/list/astro-ph/new>)
purely based on the title!
preferably on “[Solar and Stellar Astrophysics](#)” or “[High Energy Astrophysical Phenomena](#)”, but feel free to pick a title both of you like

Let's take 5 min to do this



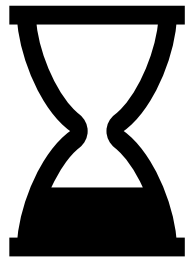
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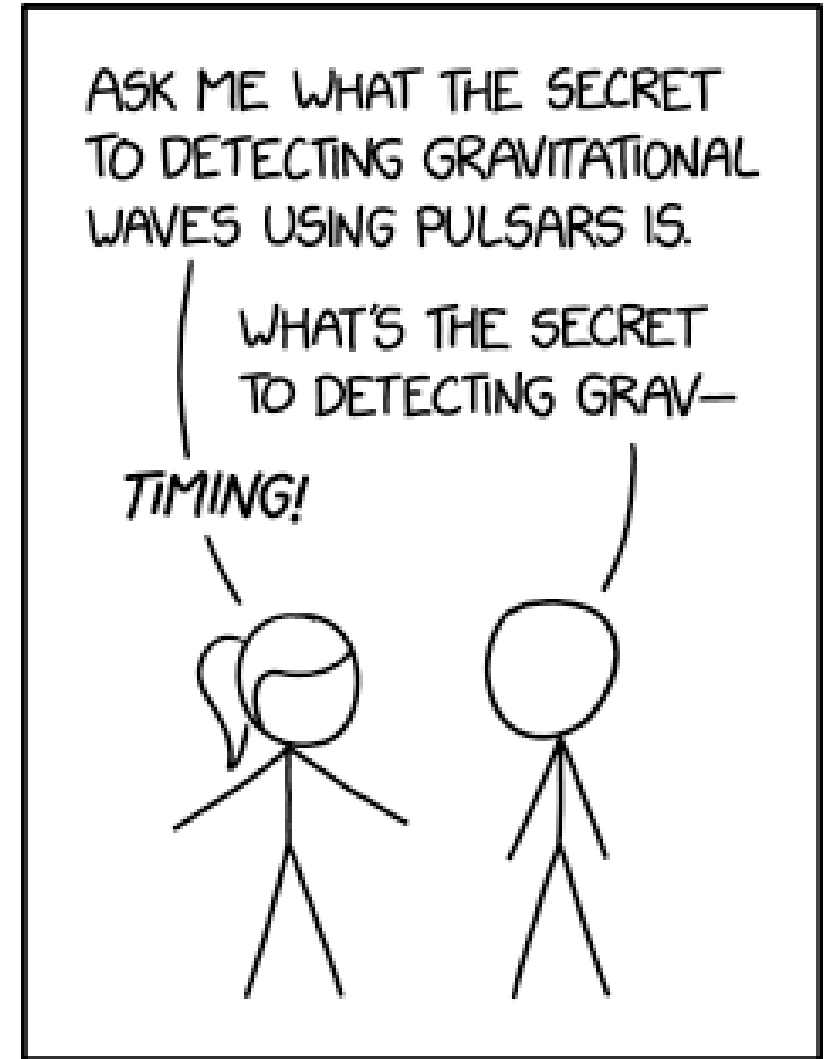


Time for some practice!

1. Now you both open the same paper:
 - One of you tries to summarize the main findings based on the **conclusion section**
 - The other person tries to summarize the paper looking **only at the Figures**



Take 5 minutes...

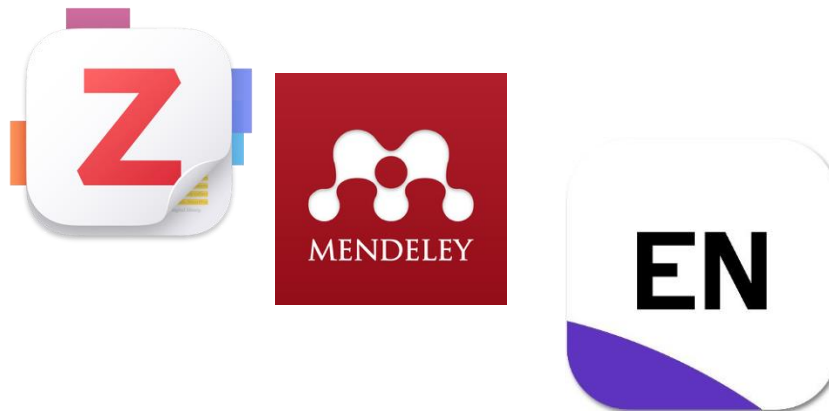


Further handy tools

You will have to read a *lot* of paper if you stay on the academic path

Now is the time to experiment with different **Citation managers** most common are

- Zotero
- Mendeley
- EndNote

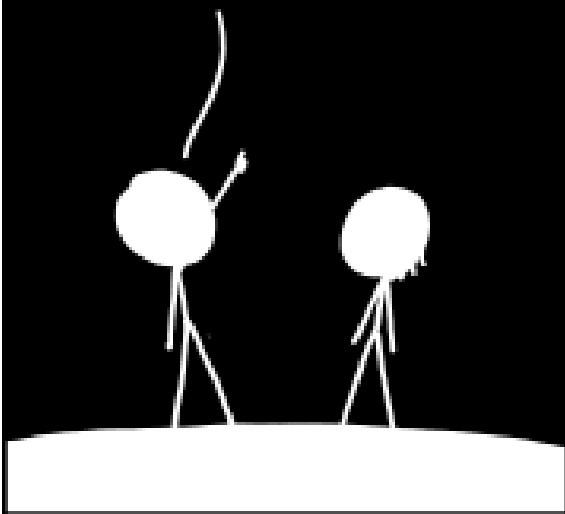


New **AI powered** research tools, like Elicit, Semantic Scholar, Research Rabbit etc. etc. etc. (beware, they might be paid)

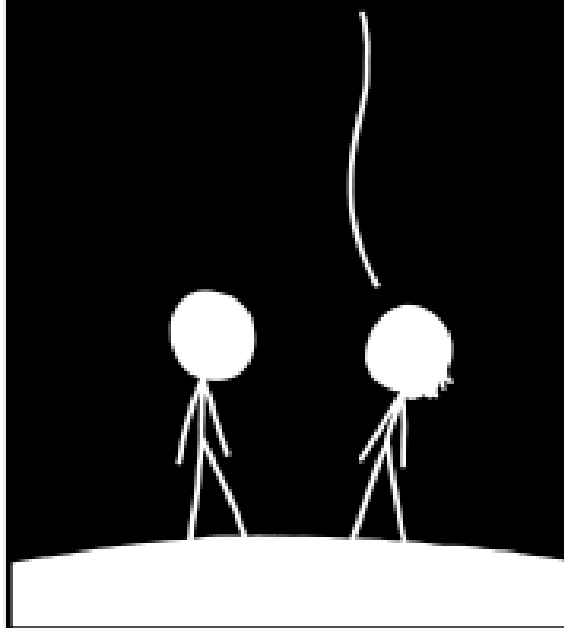
Always check the original reference! LLM's are designed to hallucinate

Questions?

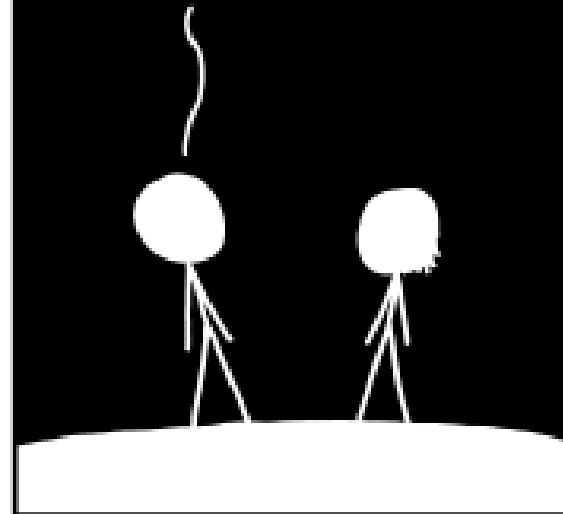
JUST THINK- THE LIGHT FROM
THAT STAR WAS EMITTED
THOUSANDS OF YEARS AGO.
IT COULD BE LONG GONE.



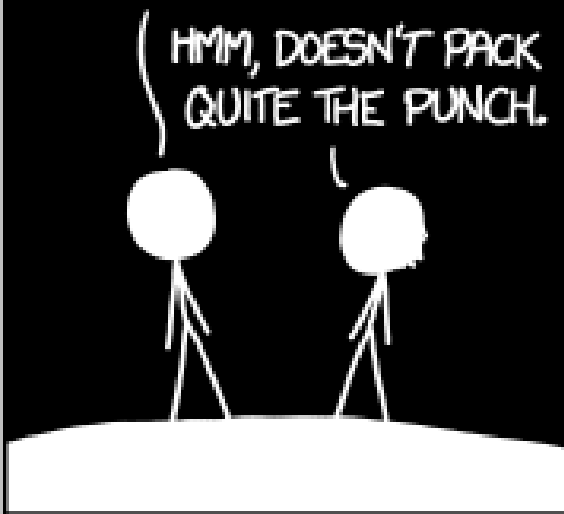
THAT'S SIRIUS. IT'S EIGHT
LIGHT-YEARS AWAY.



OH.



JUST THINK- THE LIGHT FROM
THAT STAR WAS EMITTED IN
THE PREVIOUS PRESIDENTIAL
ADMINISTRATION.

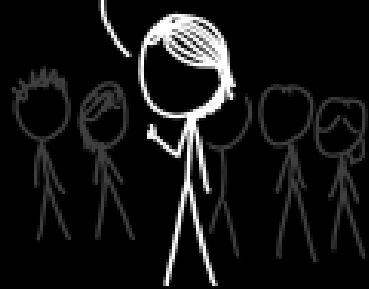


HMM, DOESN'T PACK
QUITE THE PUNCH.

WELCOME TO
STARGAZING,
WITH YOUR
HOST, ME.
I'M A DOCTOR
OR WHATEVER.



I'M NOT GONNA
WASTE YOUR TIME ON
THE SHITTY STARS.
JUST THE GOOD STUFF.
HONESTLY HALF OF 'EM
JUST LOOK LIKE DOTS.



THIS IS SIRIUS. IT'S THE
BRIGHTEST STAR IN OUR
SKY SO IT'S IN CHARGE.
IT'S REALLY TWO STARS,
BUT ONE OF THEM IS
BARELY EVEN TRYING.

THIS IS ANDROMEDA.
IT'S TOO BIG TO THINK
ABOUT, SO LET'S NOT.



THAT RED STAR IS BETELGEUSE.
IT'S GONNA EXPLODE SOMEDAY.
CAN'T HAPPEN SOON ENOUGH,
AS FAR AS I'M CONCERNED. I-

HOLY SHIT DID YOU
SEE THAT METEOR!?!
SPACE IS AWESOME!



ARE YOU SURE YOU'RE
AN ASTRONOMER?

PEOPLE KEEP ASKING THAT,
SO I FINALLY TRIED TO LOOK
THAT WORD UP IN A DICTIONARY,
AND WOW IS THAT BOOK EVER
BORING. NO THANK YOU.

BUT-

SPACE!

