

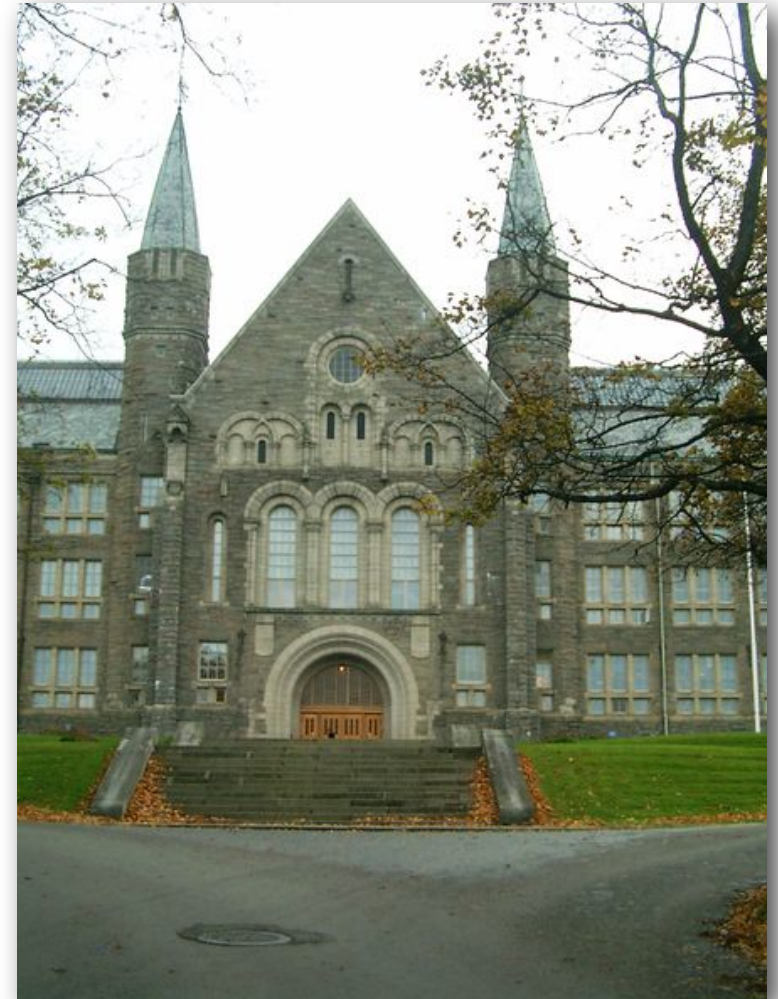


**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

# PhD research plan

Purpose and requirements

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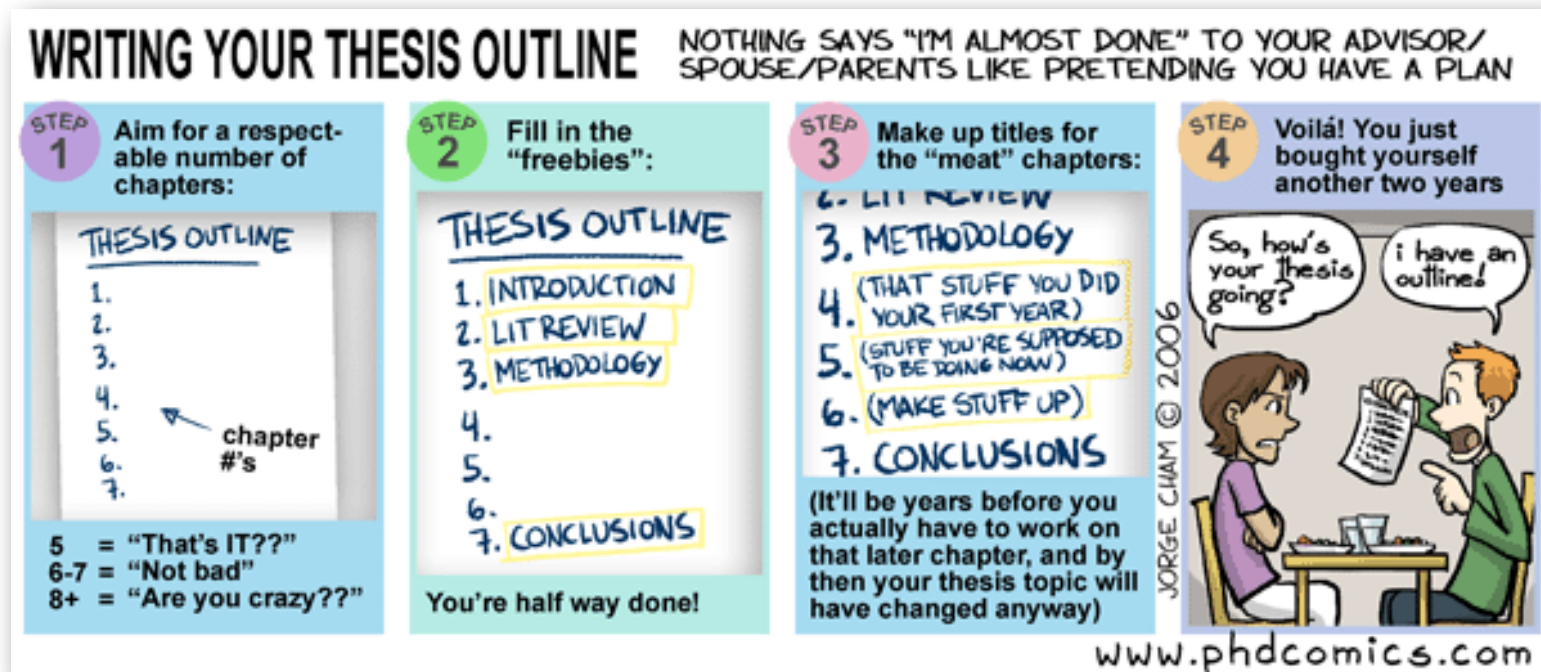
# Procedure

- An outline at admission
- Detailed required after 6 months
- Template provided
- The *process* important
- Collaborate with supervisor, but:
- **YOU should be in charge**

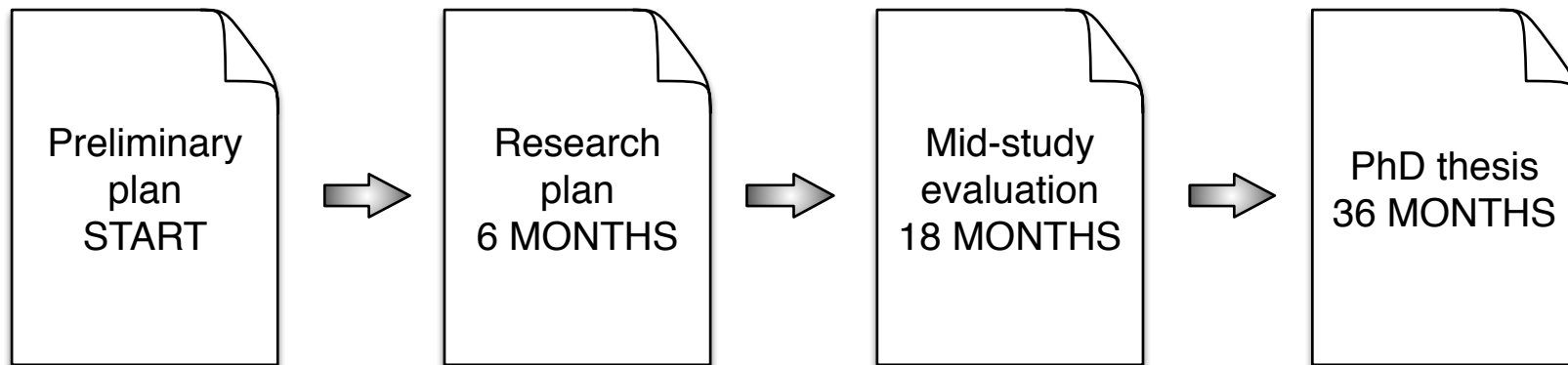


# Outline of research project

- Background
- Objectives
- Scope
- Research methods
- Expected results
- Work plan
- References

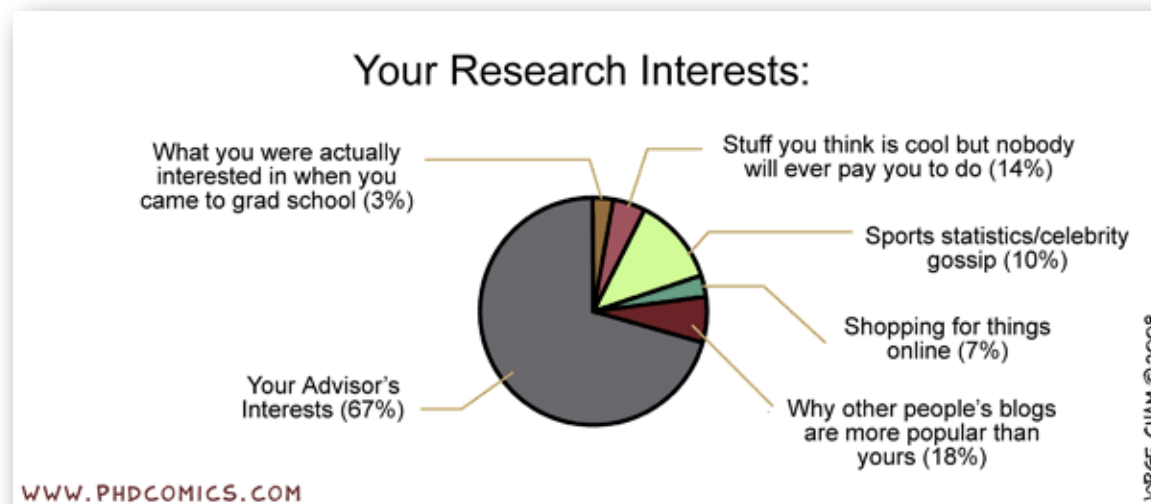


## Plan 2 thesis



# Background

- What topics and challenges will be addressed?
- Why is the topic of relevance/interest?
- Describe state of the art
- Position your planned work relative to state of the art
- What are the expected new knowledge?



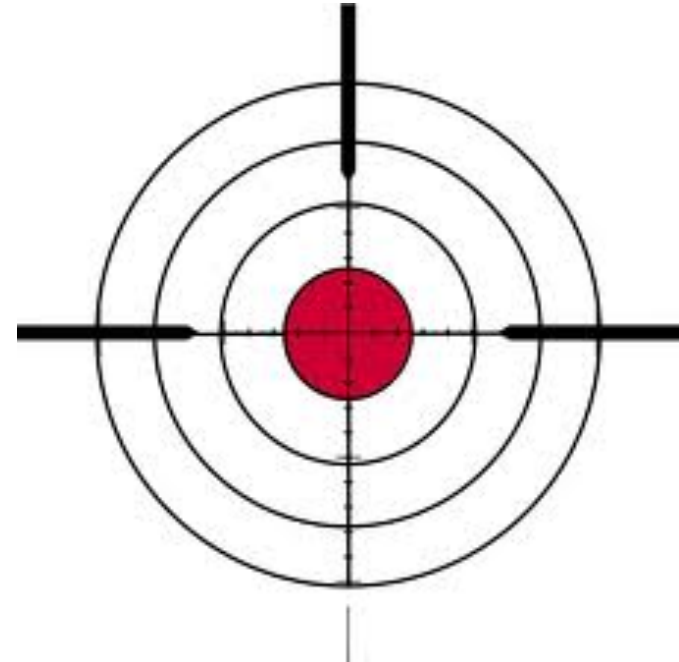
# Objectives

- Academic (course plan)
- Scientific (research goals)
- Verifiable objectives



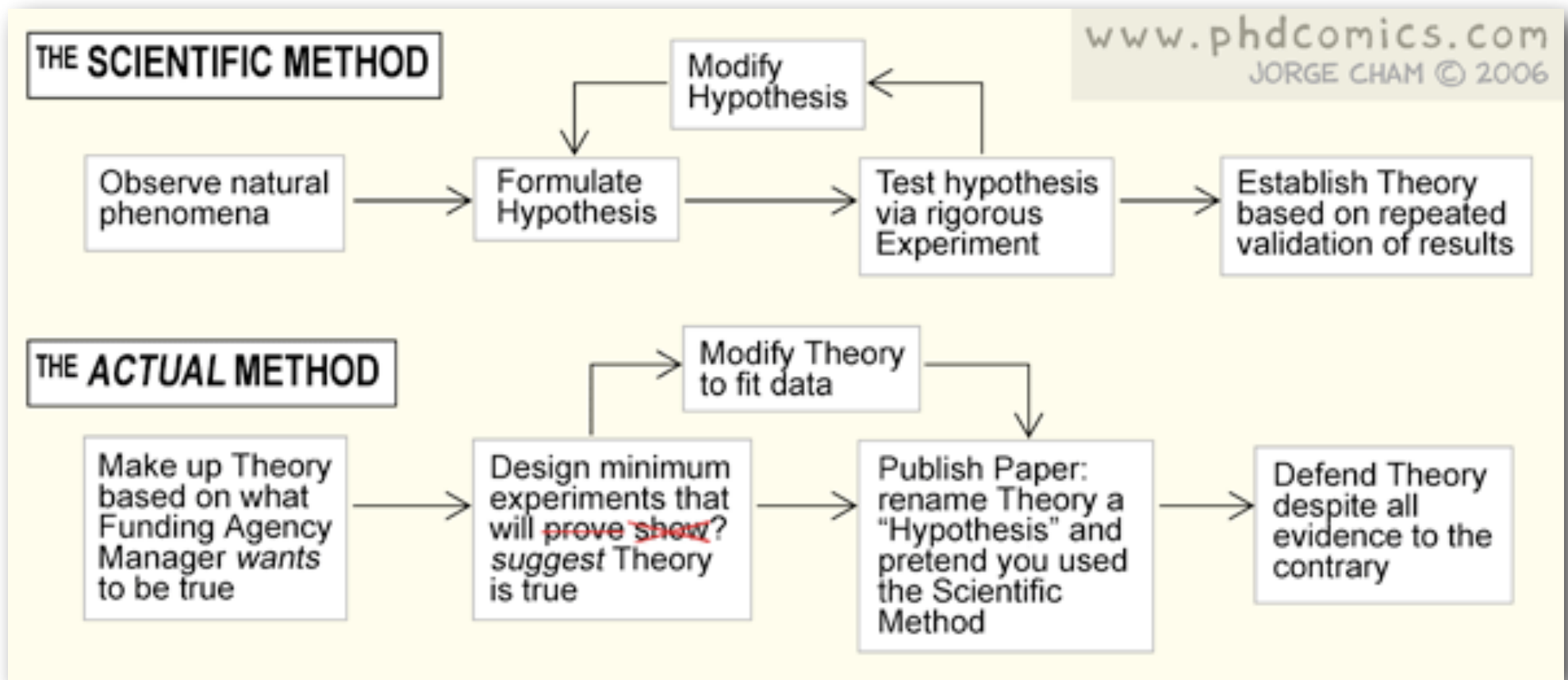
# Scope

- Limitations of work?
- Problem domain
- Outside scope?





# Research methods





# Expected results

- Potential new knowledge
- Generalizations
- Applicability
- Usefulness

## THE METHODOLOGY SECTION TRANSLATOR

### What it says:

### What it really means:

"All procedures were approved by the Internal Ethics Review Board"

"Please don't come protest outside our lab."

"Samples were treated with 0.03% sodium citrate buffer for 60.3 min. at 37.4 deg with 20.5 mg/kg poly(I:C) dissolved in 0.97% sterile PBS volume of 8.2 ml/kg"

"If you deviate from this by one number, it's not my fault when you can't replicate my results."

"The solution was isolated using catalyst CH<sub>2</sub>Cl<sub>2</sub>/Et<sub>2</sub>O 4:1 in 71% yield as a mixture of 1 H NMR (CDCl<sub>3</sub>) δ 7.90 (ddd, J = 3.2, 5.2, 20.4 Hz, 1H), 7.30 (dd, J = 0.8, 2.0 Hz, 1H)"

"My advisor has no idea what this means."

"Measurements were performed with  $-1.74 < \eta < 1.74$  around a field of 1.16T with  $\sigma(pT)/pT \approx 0.5\% pT/GeV + 1.5\%$ "

"I don't know why this works but this is how the previous grad student taught me to do it."

"Experimental kits from a commercial vendor were used and applied according to the manufacturer's instructions."

"We wasted a lot of time trying to do it ourselves, but it turned out you can just buy it."

"Filter and gain settings varied with experimental conditions and objectives."

"We twiddled the knobs until it worked."

"Simulation parameters were chosen based on empirically realistic values."

"We made stuff up."

"The treated preparation was incubated overnight."

"I went to have a few beers with my friends."

"Analysis was performed using a commercially available software package."

"I put the numbers into this magic box and out came my thesis!"

"Statistical significance was assessed using the Student's T Test."

"Yes, all that just to verify it with something they teach in High School now."

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# Work plan

- Course plan
- Teaching assistance
- Outline of your ambitions
- Must be flexible!



- Plan is a *living document*
  - rough plan for whole period
  - more detailed plan for next year
  - check status
  - revise if necessary

# Work plan – Gantt chart example

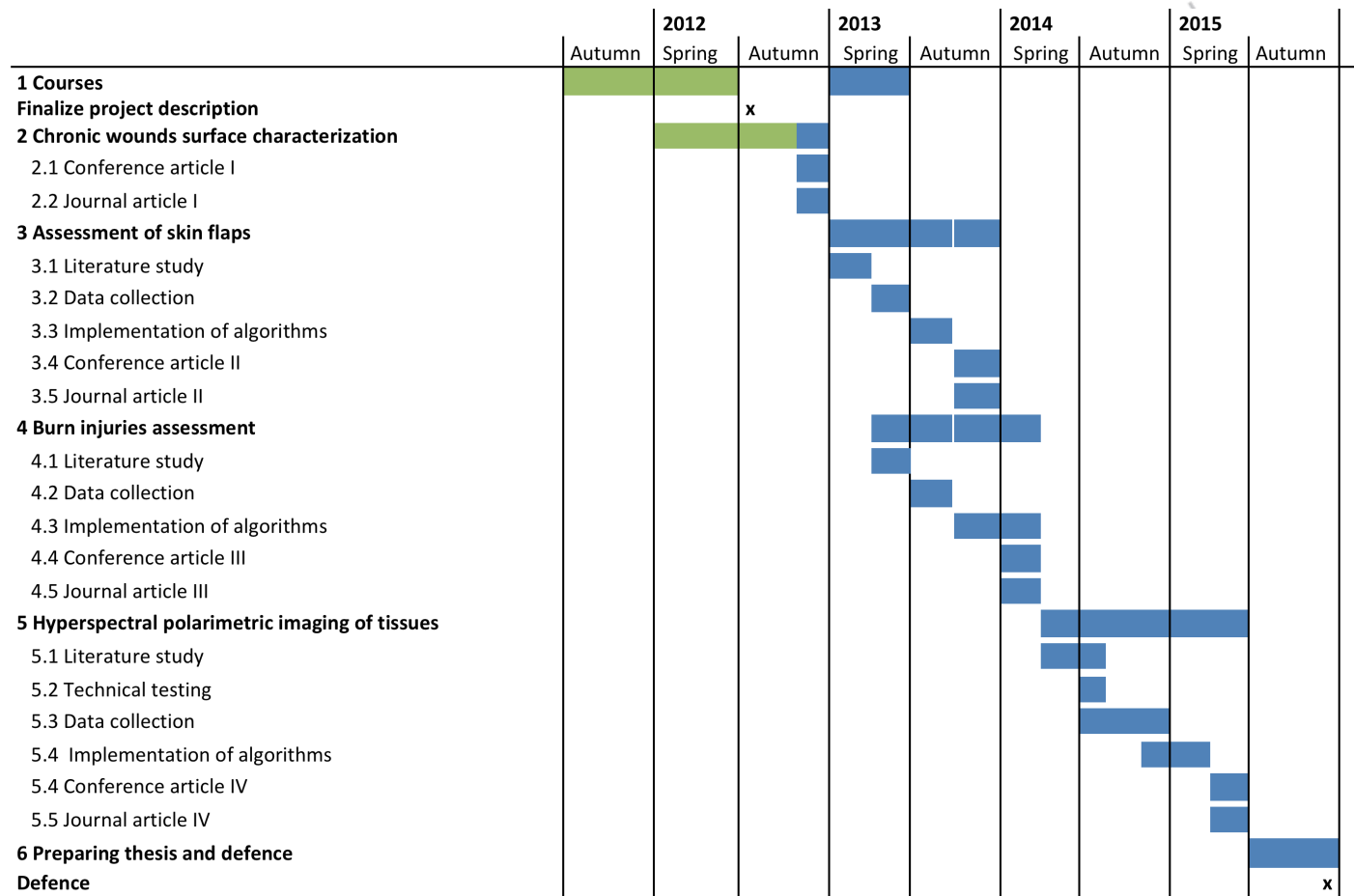
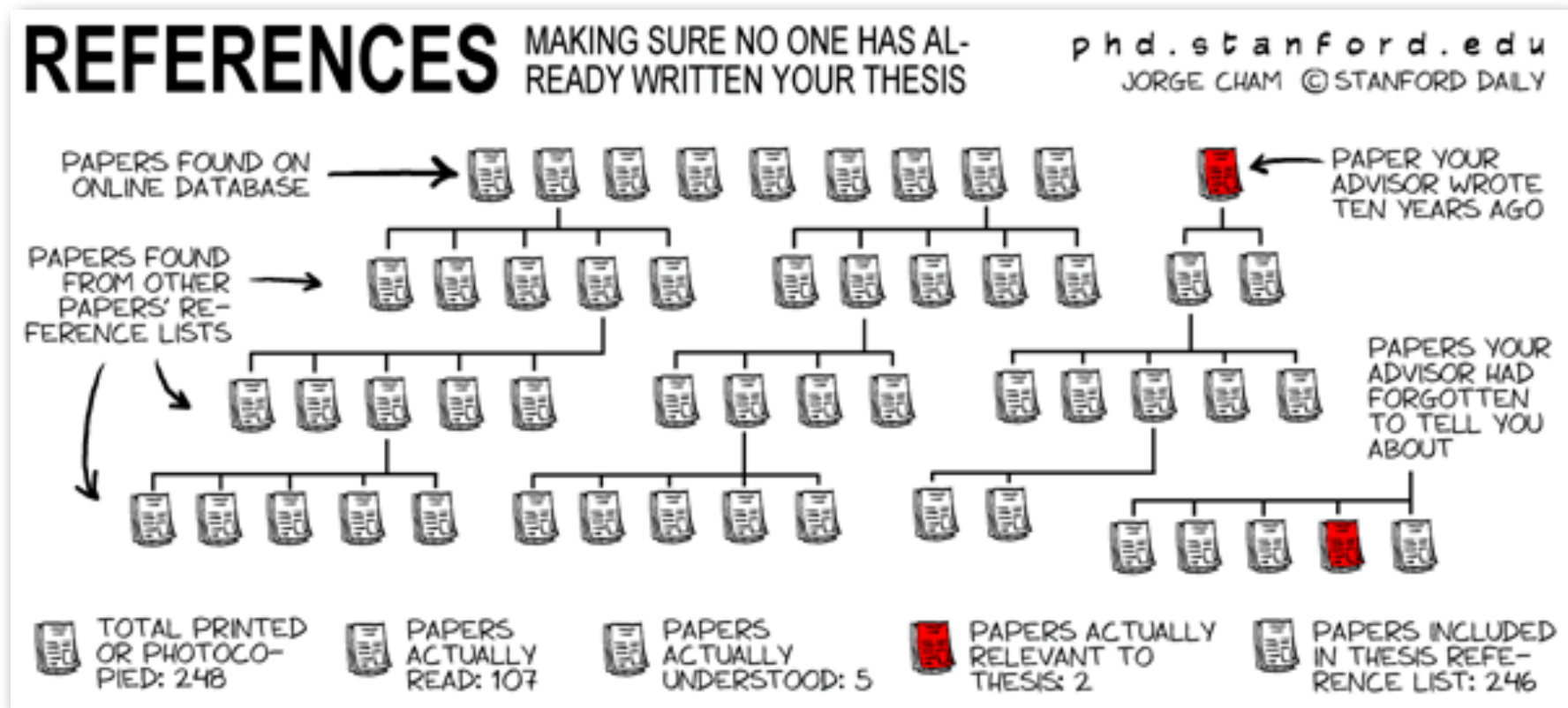


Figure 1 Gantt diagram for planned research work

# References

- Background
- State of the art



# Enjoy the Journey

# After this seminar

## ■ Set up a meeting with your Supervisor, discuss:

- Your and supervisors ambitions and expectations
- How to best be part of the scientific community, at NTNU and internationally
- Format and frequency of guidance (supervision), including co-supervisors (and mentors)
- How to keep the research plan as a living document throughout the studies
  - ➔ ... set milestones
  - ➔ ... mid-way evaluation

## ■ Keep track of your time!

- Time budget ( all kind of activities)
  - ➔ The coming week (right after this seminar)
  - ➔ Last week before next seminar
  - ➔ Compare these two!

## ■ ASK!

- any question asked is better than NOT asked

