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# The MASS<sup>3</sup> Monthly

MONASH ADVANCED SCIENCE & SCIENCE SCHOLAR SOCIETY NEWS

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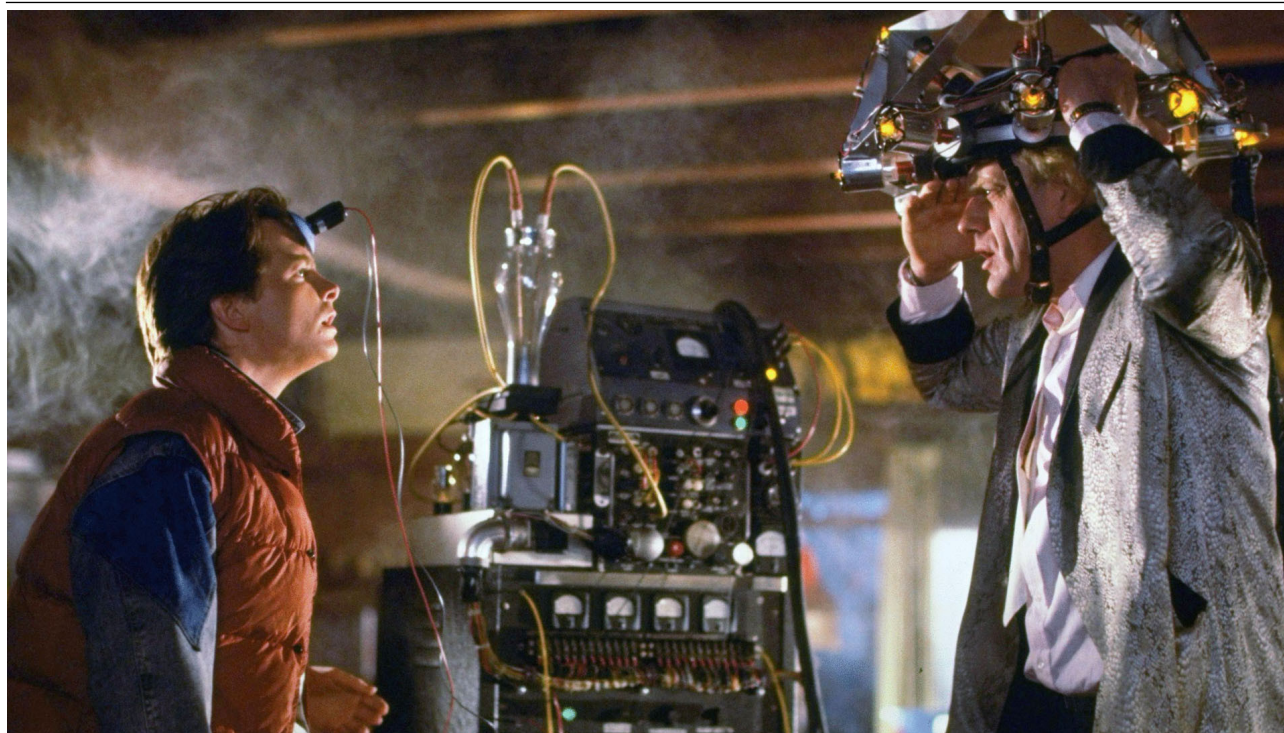


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## Science; Fiction? An Opinion-Editorial piece by Carlos Melegrito

Great Scott! The future is finally here, three decades in the waiting— and Robert Zemeckis' most famous sequel is the greatest prophecy ever recorded. (Read it on Page 3)

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# New Committee, New Newsletter!

MASS<sup>3</sup> COMMUNITY NEWS BY CARLOS MELEGRITO

What's that? Something *feels* different, you say? Well, I completely understand what you mean. I feel it too, it's such a huge change. Yes, you're right: the greenhouse gas emissions graphs next to the elevators in the Green Chemical Futures building increased a little. Ugh, now *everything* feels so much out of place.

Huh? Oh! You're talking about the new MASS<sup>3</sup> Committee! You'd be correct too. The elections late last month brought in some brilliant ~~stand-up-comedy~~ speeches from the nominees, and the votes to find the best of those gave the committee some new faces:

- **Michael “Keith” Beards**, President
- **Victoria Bicknell**, Vice-President
- **Jack Dorrat**, Secretary
- **Peter Halat**, Treasurer
- **Jacqueline Saykao**, Events Coordinator
- **Martin Nguyen**, ~~Education Officer~~  
Sunshine Chieftain, Ra
- **Hans Kek**, Webmaster
- **Carlos Melegrito** (Hey, that's me!),  
Editor

And we've kept our representatives until the end of the year!

- **Gabriel Dwyer**, Global Challenges  
Representative
- **Kathleen Strumila**, Research Advanced  
Representative

Although as exciting as it is to bring in new members, we've had to say our dear goodbyes to our beloved 2015 committee members. *We're going to miss you guys!*

And that's the news. Wait, huh? Oh! You mean you were talking about the newsletter all along?! Well, I changed some fonts here and there, moved a bit of the text, then I deleted the file, and started a new one. You know, *small* changes.

Plus: I'm amping up the publishing to a monthly issue—because let's face it, you need something better to read than your News Feeds. In exchange however, new issues will be a short, sharp publication (compared to the full-length version in previous years).

And that's the *news*. Have a read through the rest of the newsletter for some cool new sections I've introduced and re-introduced. I'm hoping that you'll enjoy this as much as I do.

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# Science; Fiction?

OP-ED BY CARLOS MELEGRITO



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Mark your calendars, sync your wristwatches, and prepare your diverse array of alarm clocks! After 3 decades of waiting, October 21, 2015 is now fast approaching. Yes, you read that right: it's the day *Marty McFly* travels from good ol' 1985 into *The Future*!

It's probably the greatest prophecy ever recorded. In director Robert Zemeckis' most famous sequel in one of Hollywood's greatest trilogies, *Back to the Future, Part II*, protagonist *Marty McFly* uses his DeLorean time machine to travel to the future to fix potential problems that he will face. In the iconic scene, Marty encounters flying cars, hover boards, self-



lacing shoes, self-drying jackets, kids wearing their clothes inside out, and a whole bunch of other near out-of-whack tidbits that would have deemed almost impossible by those back in the 80's.

And yet today, we see the (fictional) past mirror the present ever-so closely! We're on our way to ditching old *gas-guzzling*



cars, self-lacing shoes are a thing now, and our nostalgia for the 80's is up and alive for sure. Plus, perhaps even more creepy than coincidental, is the win of the US Baseball team, *Chicago Cubs* in the major leagues! (*True story*. Google it!)

Crazy stuff. The real story that *Back to the Future II* brings, is that no matter how far-fetched people thought the ideas in the movie were, turned out to become close to reality later in the future. If you can think it, you can build it. That's the real future Robert Zemeckis brings us to in his film.

That means the future, no matter how crazy you think it'll be, is something definitely achievable! And so, dear scientist— with your skills, talent and knowledge— don't let the craziness of your dreams scare you. Let the future be as exciting as you imagine!

(Oh, and if I were you, I'd spend this week watching all the *Back to the Future* films. Totally worth it.)

## Sudoku Puzzle (Level: Medium)

		1			8			
	2			3		7		
3			5					8
		6	8		1	2		
		9		4		1		
		8	6		3	5		
1					6			9
		4		2			1	
			1			8		

### How to Play:

- The objective of the game is to fill the 9x9 grid on the left with numbers.
- Every 3x3 grid, column and row must contain at most one of the integers from 1 through 9.
- Usually, Sudoku games are timed. So take a challenge and try and solve this one under 5 minutes!

Update 10/18: Replaced with newer puzzle, courtesy of Ben Jones



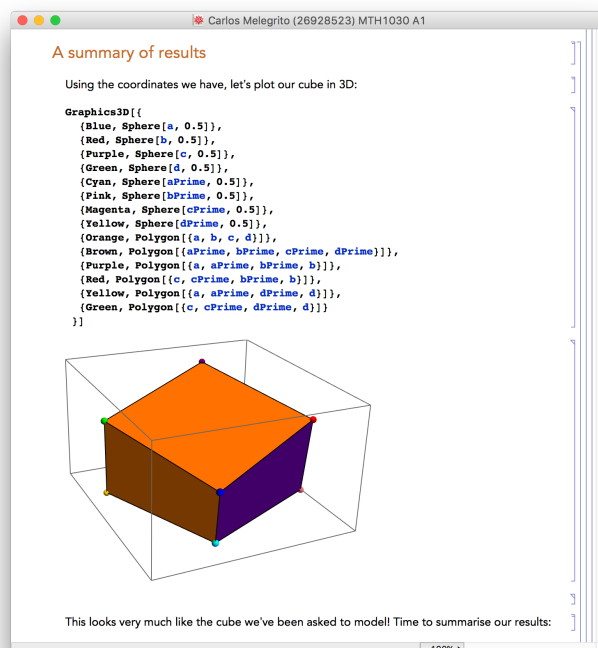
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# A Look at Wolfram Mathematica

TIPS AND TRICKS BY CARLOS MELEGRITO

Whether you're doing an extended major in Mathematics, or you're just writing reports for your Philosophy minor, *Wolfram Mathematica's* one of the best calculator-slash-math-typesetters out there.

If you've never heard of it before, I highly recommend you check it out and download it over at [wolfram.com/Mathematica](http://wolfram.com/Mathematica). For its value, it's quite pricey, but as a student of Monash University, you're entitled to download the Student Edition for free! (Ask a fellow MASS<sup>3</sup>-ian for details).



Simply put, *Mathematica's* a more (insanely) powerful, digital version of the CAS calculators you once used in high school. That means, besides neatly laying out equations and calculations, you can do some intense shizzle with it.

When you've got it up and running, have a play around and experiment to see what you can do. There are only two basics to remember really: hitting Shift+Enter after a calculation gives you the result, and pressing F1 (or Function + F1 on a Mac) gives you the Help window.

However, if you want to extend your power over *Mathematica* here are some handy syntax snippets, tips and tricks:

## Assigning Functions

`f[x_] = x^2`

`g[x_, n_] = (-1x)^n`

`f[1]`

`g[8, 3]`

Assigning variables is one thing, but assigning multi-variable functions is a whole new level of cool. Try pasting the above snippets into *Mathematica*.

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## Clearing variables

```
Clear[f]
```

```
Clear["Global`*"]
```

So you're writing your Maths assignment, and there are questions that require you use a variable with a name you've used before. What do you do? Use the above. Note: the second line clears all variables.

## Plotting points

```
a = {0, 0, 0};
```

```
b = {0, 0, 1};
```

```
c = {0, 1, 0};
```

```
d = {0, 1, 1};
```

```
e = {1, 0, 0};
```

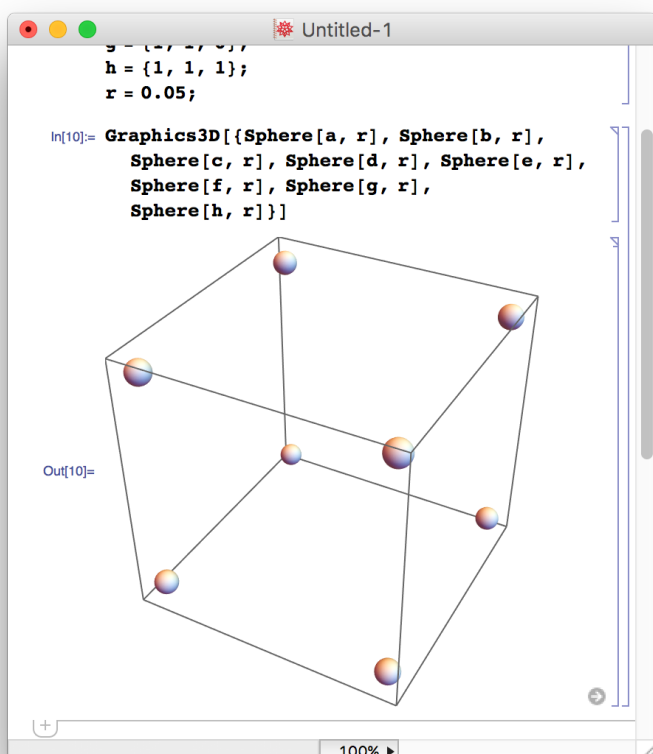
```
f = {1, 0, 1};
```

```
g = {1, 1, 0};
```

```
h = {1, 1, 1};
```

```
r = 0.05;
```

Say you have the following points in 3D space above. Want to see how they look like? Try pasting the code below:



```
Graphics3D[{  
  Sphere[a, r],  
  Sphere[b, r],  
  Sphere[c, r],  
  Sphere[d, r],  
  Sphere[e, r],  
  Sphere[f, r],  
  Sphere[g, r],  
  Sphere[h, r]  
}]
```

What you get is a plot of each point as a sphere of size  $r$ . Cool, no? You can even connect two points together by using `Line[{a, r}]`, or even setting colours of spheres such as `{Red, Sphere[a, r]}`, go all the way with polygons using `{Rainbow, Polygon[{a, b, c, d}]}`.

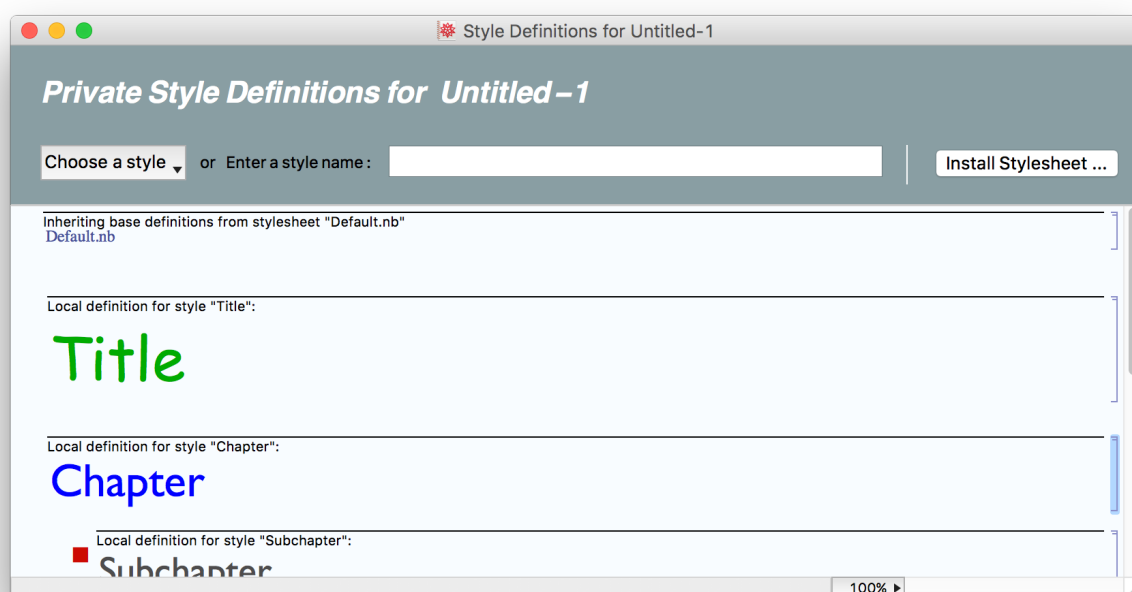
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## Splicing Values

```
eq = Solve[x^2 + 5 x - 6 == 0, x]
x1 = x /. eq[[1]]
x2 = x /. eq[[2]]
```

So you have an equation to solve, but you need the values? Try and run the code above. The operator /. “splices” the value to its left from the value on the right. This is really useful when you’re solving for irrational floating point numbers.

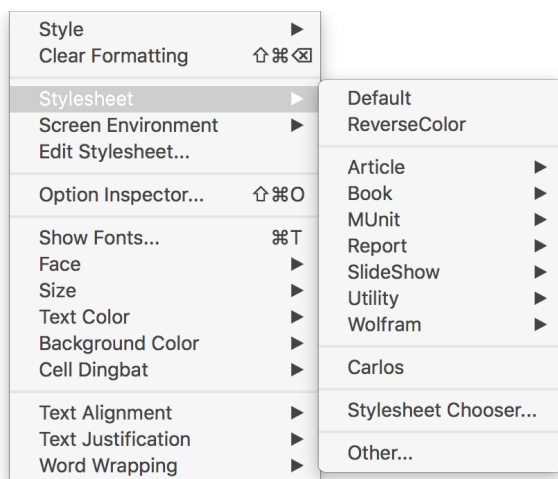
## Custom Templates



*Mathematica*’s just as good a calculator as it is a typesetter. That means can type up entire Math assignments or reports right in Mathematica, without using *Word* or anything else—because you can simply export your file as PDF, and presto, ready for printing.

Here’s the thing though: when you hand in that PDF, it’s gonna look very much like everyone else’s. If you crave for a style of your own, with custom fonts and all, check this out:

Go to the Format menu and select “Edit Stylesheet”. This’ll bring up a window that will allows you to create your own template (so you don’t have to keep changing fonts for every new document).



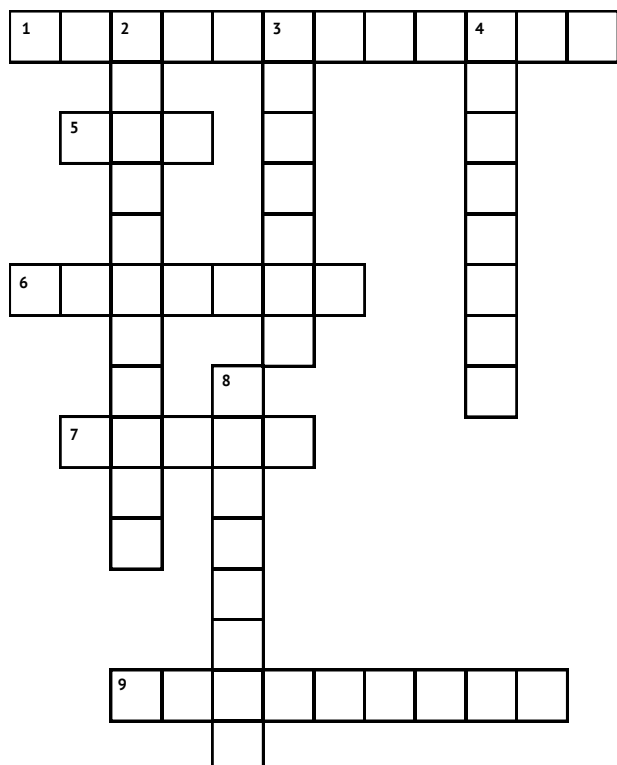
In that window, hit “Choose a style”. In dropdown, select the style you’d like changed. Next, go to the Palettes Menu, and click “Writing Assistant”. Now, go forth and style!

Once you’ve finished applying all the necessary styles in that template, write the name of this new template of yours in the box next to “Enter a style name:” and then click “Install Stylesheet”. Hit “OK”, and you’ve saved a template!

To access your template, simply go to the Format menu again, click “Stylesheet”, and select that template of yours in the dropdown. Get ready for some *impressed* Math tutors!

*Share these tips!* They might not only help you, but help so many others enjoy *Mathematica* even more!

## Crossword: Biology Crash Course (Easy)



### Across:

1. Respirating organelle, has its own DNA
5. Hot polymerase
6. Mosquito sickness
7. Body’s detox
9. Visible DNA

### Down:

2. RNA reading
3. 23 chromosomes
4. Protein factory
8. End DNA

Update 10/18: Changed 1 Across to look less vague. Thanks again, Ben Jones!



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# Monash CLV (Careers & Volunteering)

SPECIAL THANKS TO OUR SPONSOR

Are you prospecting for a job? Unsure of what your career's going to look like after your degree? Or are you simply look for work that not only looks great on your resumé, pays the bills, but also is within an industry you're academically profound in? Fret no further, because *Monash University* has a service dedicated just for that!

Simply browse on over to [monash.edu.au/careers](https://monash.edu.au/careers), or visit a branch over at Campus Centre! Not only do they provide comprehensive information about finding the right job, they also provide workshops on improving your resumé, cover-letter writing skills, and even on-the-spot practice interviews (and more)!

## Upcoming Monash CLV Events

- *Practice Interview Session*, October 21, Clayton Campus (Campus Centre Branch) — <https://careergateway.monash.edu.au/students/events/detail/2408154>
- *Small Business Victoria: Starting Your Business Workshop*, November 10 — <https://careergateway.monash.edu.au/ViewEvent.chpx?id=2315280>

For more information about events, visit <https://www.monash.edu.au/students/career-connect/seminars-events.html?source=careers-connect-home>.

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## Upcoming Events in MASS<sup>3</sup>

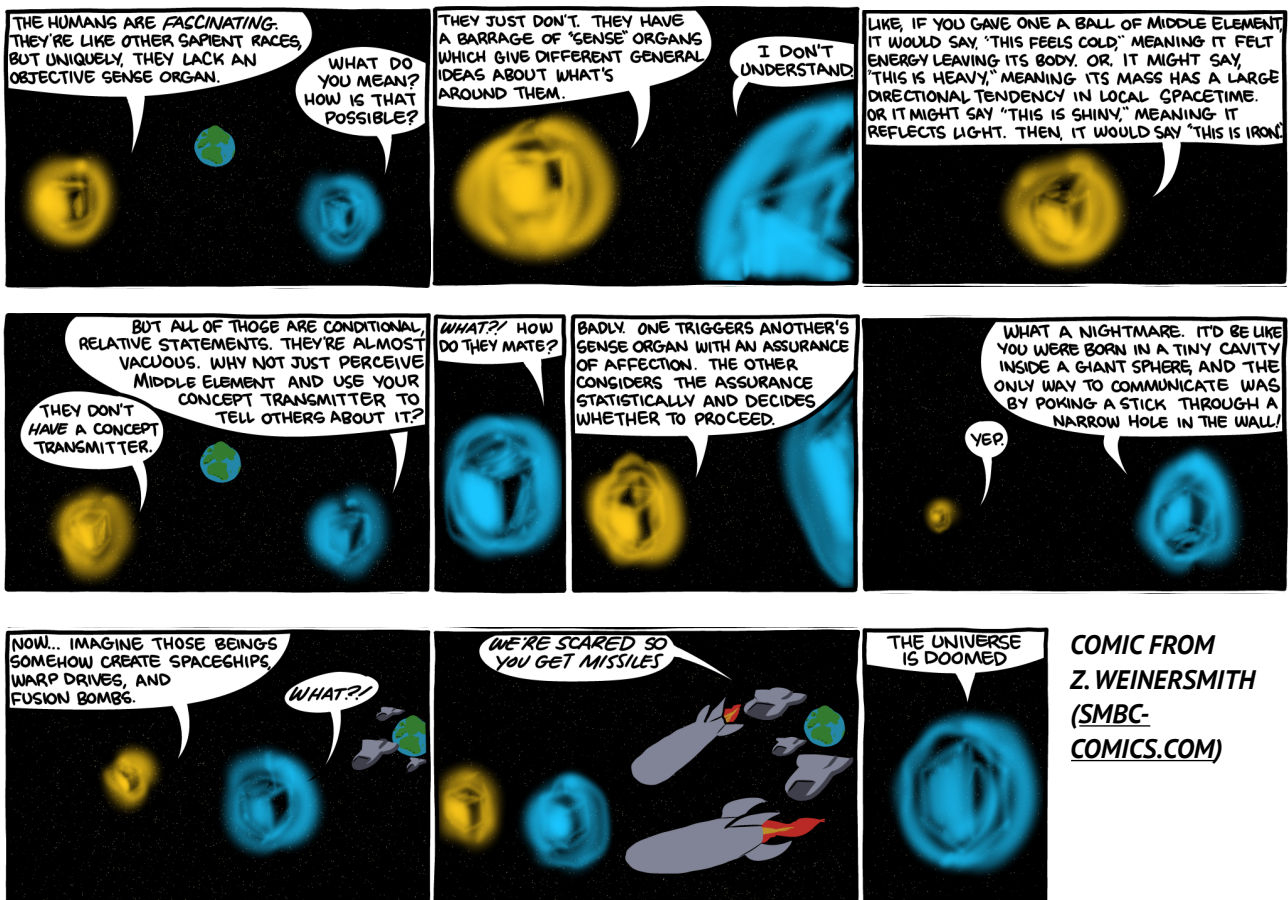
### Study Night, Part 2

- **When:** Thursday, October 22 at 6:00pm
- **Where:** The Advanced Science Students Common Room (19 Rainforest Walk)
- **Why:** You're chillin, studying a bit here and there.. Then you look at your calendar and it's week 12! How did that even happen?! Exams are right around the corner, you realise you've gotta start cracking down on your study. Make use of this last chance to study hard with your fellow sciencey peers and head on down to Study Night pt. II
- **Food?** Nachos and snacks, and feel free to bring your own!

Got a plan for an event? Contact our new events coordinator, *Jacqueline Saykao* for more information! (Details on [masscubed.com](https://masscubed.com))

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## Comic: Understanding Humans in The Universe



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## Puzzles

### Perfect Square of Threes (Easy):

Find the smallest  $x + y + z$  with integers  $x > y > z > 0$  such that  $x + y$ ,  $x - y$ ,  $x + z$ ,  $x - z$ ,  $y + z$ ,  $y - z$  are all perfect squares.

### A Waiter's Dilemma (Hard):

You're a waiter at a restaurant, and you're about to ask a table of 4 for an order. They tell you they have *exactly* \$20 to spend. They're asking which items from the menu (below) they should order, with the highest total sum of stars. What do you recommend?

#### Menu:

Fillet Sauvignon (1.5/5 stars) – \$6	Ratatouille Dessert (4.0/5 stars) – \$20
Le Stir-Fry Bake (2.5/5 stars) – \$5	Degustation Diet (2.0/5 stars) – \$5
Side Dish with Main (0.5/5 stars) – \$2	
Blanched Soufflé (3.0/5 stars) – \$10	

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## Questions? Feedback? Comments? Suggestions?

I really hoped you like this new version of the MASS<sup>3</sup> Newsletter. It's not as in-depth or long as the classic, original design, nor as fancy, but these short and sharp issues should hopefully entertain you for the months to come!

But if you're looking to help improve this re-issuing, or any general feedback about the club at all, feel free to contact the committee at [mass3@monashclubs.org](mailto:mass3@monashclubs.org) — and don't worry, we don't bite! Furthermore, if you want to contact me, the Editor, directly, shoot me an email over at [cjmel2@student.monash.edu](mailto:cjmel2@student.monash.edu).

That said, I'm always looking for more content to add in the newsletter. If you've got ideas for posts, or if you've got the itch to write something, let me know! I did mention during my candidacy speech, that I'm looking to use the newsletter not only as means for myself (as a first year) to get to know and understand the community better— but also to bring all of us closer together.

Here's to 2016! (Oh, and good luck with your exams!)