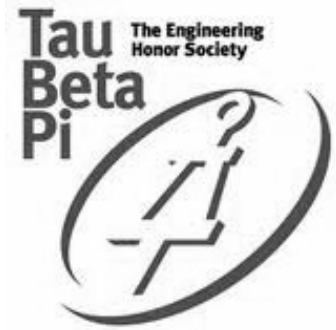


The Cornerstone



Volume 11, Issue 5

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MI-Gamma

A Letter From the Editor

Inside this issue:

Letter From the Editor	1
Response to Arthur Shih	2
Sudoku Puzzles	5

Important Dates:

All meetings start at 6:30pm in 1013 DOW (unless otherwise noted)

- *Third Actives (actives only) — Tuesday, March 19*
- *Elections — Tuesday, April 2*
- *Initiation — Sunday, April 14, 4pm 1109 FXB*
- *Banquet — Sunday, April 14, 6pm Campus Inn*

It's spring!!!

Ok. It's not spring, but after the weather we were having yesterday I could have sworn it was on the immediate horizon. Then again, the snow is once again flurrying down from the sky. Sigh. Is this over yet, it's already March. Where is our sunshine and warmth?

I don't know what you guys did for spring break, but if it was anything like mine, it consisted of copious amounts of sleep and food. My favorite two things. Speaking of which, do you have awesome pictures or stories from spring break? Tell me! Write about how you went backpacking in Ecuador or spent the week working on a Habitat for Humanity house. Or maybe you didn't change out of your pajamas for the whole week...not that I did that. :)

And if you need any more incentive, I will be purchasing ice cream for those of you who provide me with articles for the Cornerstone (as if you needed any more reasons to). So kick it back into gear and email me (TBPcornerstone@umich.edu)! You can provide articles/comics/puzzles/etc. If you have any questions send it along, and I can give you feedback.

Sincerely,
(one of) your Publicity Chairs,
Gina Calco

Arthur Shih is Wrong

By Eamonn Shirey

In the last edition of the Cornerstone, our esteemed website officer, Arthur, described his experiences in explaining how airplanes fly to his younger sister. In that piece, Arthur explains how airplanes fly based on Bernoulli's Principle - that the pressure of a fluid decreases as its speed increases - and posed a challenge to the "aerospace folks" to explain the effects of compressibility on flight. You can consider this an answer to his call.

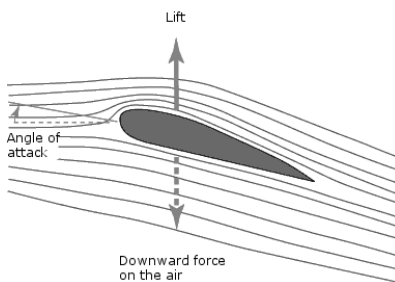
First and foremost, I feel obligated to clear something up; *planes do not fly because of the Bernoulli Principle*. Well, I mean they do, but that's only part of the story. While it is true that the air traveling above a wing will move faster than the air below it, which causes a difference in pressures, there's a lot more to flight than this. If Bernoulli was the only player in aircraft, paper airplanes wouldn't work and acrobatic aircraft couldn't fly upside-down.

When looking at the aerodynamics of flight, a person really needs to use the Navier-Stokes equations,

$$\rho \left(\frac{\partial \mathbf{v}}{\partial t} + \mathbf{v} \cdot \nabla \mathbf{v} \right) = -\nabla p + \nabla \cdot \mathbf{T} + \mathbf{f}$$

which are effectively meaningless unless you know what each of the terms mean and have some experience with differential equations and tensor mathematics (for brevity's sake, I'll leave those to another discussion). Basically this is a really fancy way of writing Newton's Second Law out for a tiny bit of fluid, and no one's going to fault Arthur for neglecting it during his family-vacation-inspired discussion of aerodynamics. Nor is any reasonable aerospace student going to expect you to draw this on a cocktail napkin anytime someone asks you how planes fly.

We do humbly request, however, that your first response to that most common question is a firm "It's really complicated" before going into the simplified physics. The most important phenomenon behind flight is the conservation of momentum. If you look at a wing traveling through the air, you'll notice that it is oriented in a way that pushes the air downward. We know that when a wing pushes air down, that air pushes the wing up. That's what we call lift, and it's what lets planes fly.



As to Arthur's question of how air's compressibility comes into play, the effects aren't really negligible. But given the space here, let's just leave it at "it's complicated."

Sudoku Puzzles

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



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

Sudoku Puzzles

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

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

