



1ST PHANTOM USERS WORKSHOP

CONFERENCE SUMMARY

Daniel Price
23rd Feb 2018





MoCA
Museum of Contemporary Art

MoCA
Museum of Contemporary Art

MoCA
Museum of Contemporary Art

MoCA
Museum of Contemporary Art

9:55



Template
[Handwritten notes and diagrams on the whiteboard]

Lecture

Solution
[Handwritten notes on the left whiteboard]







Magnetostatische Induktion

$$\frac{1}{\mu_0} \nabla \times \vec{B} = \vec{j} + \frac{1}{\mu_0} (\nabla \cdot \vec{D}) \vec{e}$$

$$\nabla \cdot \vec{D} = \rho_{ext}$$

$$\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t} \quad \nabla \cdot \vec{B} = 0$$

$$\frac{d\vec{B}}{dt} = \nabla \times \vec{E}$$

$$\vec{B} = \frac{1}{\mu_0} \nabla \times \vec{A}$$

Induktion

$$\vec{E} = -\nabla \phi - \dot{\vec{A}}$$
$$\frac{1}{\mu_0} \nabla \times \vec{B} = \vec{j} + \dot{\vec{D}}$$

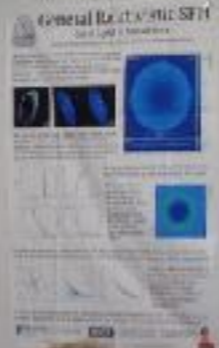
$$\nabla \times \vec{E} = -\nabla \times (\nabla \phi) - \dot{\nabla \times \vec{A}} = -\dot{\nabla \times \vec{A}}$$
$$\frac{\partial \vec{B}}{\partial t} = \nabla \times (\dot{\vec{A}}) = \nabla \times \vec{E}$$

$$\frac{\partial \vec{B}}{\partial t} = -\nabla(\nabla \cdot \vec{A}) + \nabla(\nabla \cdot \vec{A}) - \nabla(\nabla \cdot \vec{A}) + \nabla(\nabla \cdot \vec{A})$$

$$\frac{d\vec{B}}{dt} = -\nabla(\nabla \cdot \vec{A}) + \nabla(\nabla \cdot \vec{A}) + \nabla(\nabla \cdot \vec{A})$$



General Relativity
and Light



360° video of the Galactic center

1. Zoom into simulation

Clumps from
slow wind
collision

2. 500 yr of **no-outburst** simulation

3. Rewind to show...

S

4. 625 yr of **outburst** simulation:
no accreting clumps

5. Zoom out of simulation

Clump
stripped
by W1
torus





YOU START

For full and complete recipe, visit [www.healthyrecipes.com](#) or scan the QR code to download the recipe app.



1 SOAK THE NOODLES
In a large bowl, place the dry stick noodles (see suggested amount to ensure the finished dish is balanced in flavor) and enough warm water to completely cover the noodles, and soak for 30 minutes. The noodles will break starting in step 5. Drain and set aside. **TIP:** Soaking the noodles in warm water instead of hot water stops them from becoming gummy and breaking up in the pan.



2 PREPARE THE CHICKEN
While the noodles are soaking, cut the chicken thigh into 1-inch-thick slices. **Q&A for 2 people:** 1 1/2 lbs for regular and 2 lbs for large.



3 GET PREPARED
While the chicken is cooking, heat the sesame oil in a large skillet over medium heat. Add the garlic, ginger, and chili flakes. Stir-fry for 1 minute. Add the chicken and cook for 3-4 minutes. Add the vegetables and cook for 2-3 minutes. Add the soy sauce and stir-fry for 1-2 minutes. Drain the chicken and vegetables. **TIP:** Use a large skillet or wok.

INGREDIENTS

Ingredient	Amount
1/2 cup Sesame Oil	1/2 cup
1/2 cup Soy Sauce	1/2 cup
1/2 cup Garlic	1/2 cup
1/2 cup Ginger	1/2 cup
1/2 cup Chili Flakes	1/2 cup
1/2 cup Chicken Thigh	1/2 cup
1/2 cup Carrots	1/2 cup
1/2 cup Bell Peppers	1/2 cup
1/2 cup Onions	1/2 cup
1/2 cup Noodles	1/2 cup



4 TOAST THE SESAME SEEDS
Heat a large wok or frying pan over a medium-high heat. Add the sesame seeds and toast, stirring, for 3-4 minutes, or until golden. Remove from the pan and set aside.



5 RAGE THE CHICKEN NOODLES
Return the wok or pan with a drizzle of oil. Add the chicken and cook for 2-3 minutes, or until cooked. Add the noodles and cook for 1 minute, or until tender. Add the chicken thighs and cook for 2-3 minutes. Add the vegetables and cook for 2-3 minutes. Add the soy sauce and stir-fry for 1-2 minutes. Drain the chicken and vegetables. **TIP:** Use a large skillet or wok.



6 GET IT DONE
While the chicken is cooking, heat the sesame oil in a large skillet over medium heat. Add the garlic, ginger, and chili flakes. Stir-fry for 1 minute. Add the chicken and cook for 3-4 minutes. Add the vegetables and cook for 2-3 minutes. Add the soy sauce and stir-fry for 1-2 minutes. Drain the chicken and vegetables. **TIP:** Use a large skillet or wok.

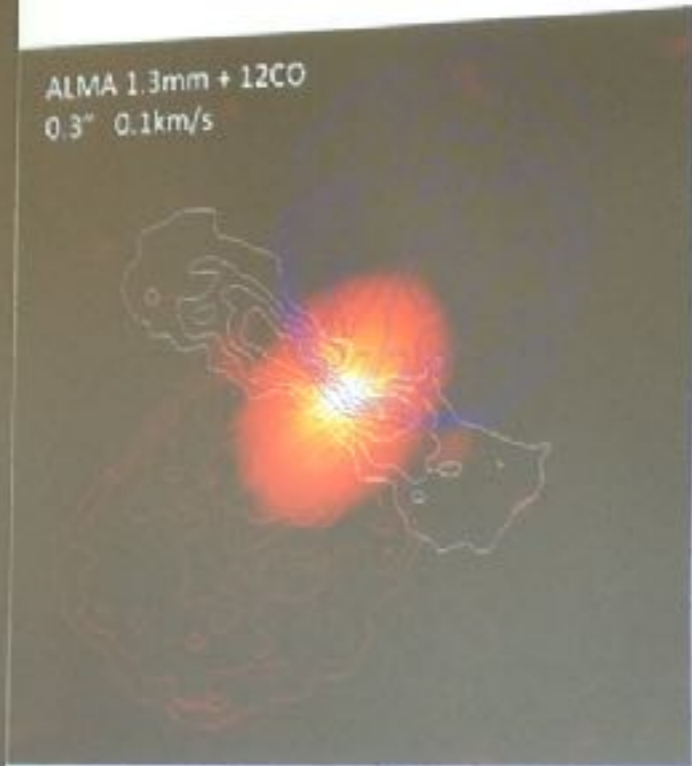
TRAVEL

A person standing in a classroom, gesturing towards a whiteboard. The whiteboard has some faint writing on it.



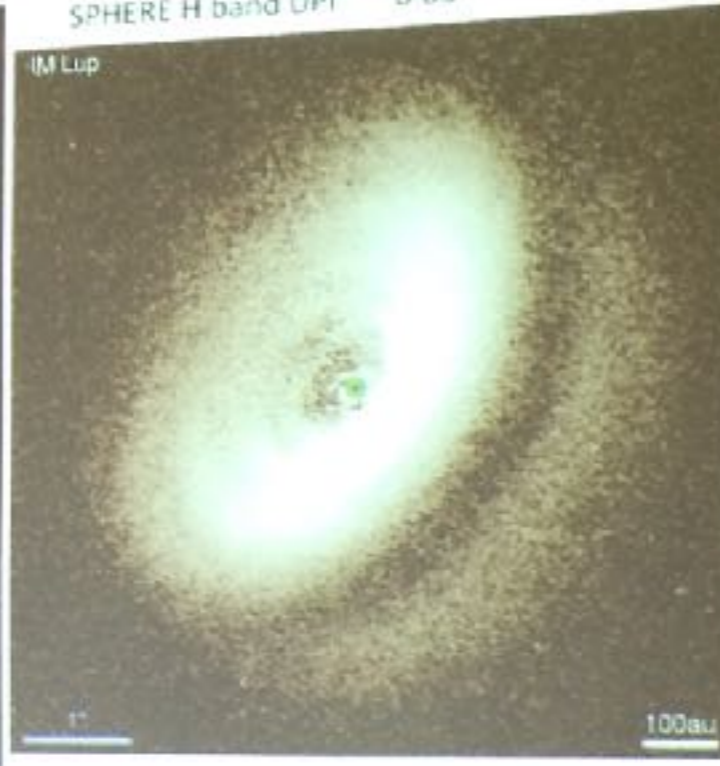
ALMA and SPHERE views of IM Lupi

ALMA 1.3mm + 12CO
0.3" 0.1km/s



Pinte et al, 2017

SPHERE H band DPI ~ 0.03"



Avenhaus et al, in prep.

$i = 50 \text{ deg}$

Mao Please
214 Little Bourke St
gravel
dust
100
100

WHAT WE ACHIEVED

- Met each other!
- Learned how to make 360 videos (thanks Chris)
- MESA Equation of state bug found and fixed (thanks Tom, Orsola, Terry)
- We broke the code several times (thanks James for fixing)
- Wonderful new Fortree tool for mapping code (thanks Esther)
- Exact interpolation will soon be possible in splash (thanks Maya)
- Further work towards Helmholtz EOS (thanks Terry, Jose)
- MULTIGRAIN is almost merged into master (thanks Daniel M)
- Possible new way of handling drag timestep (thanks Joe)
- Learned how to use the MPI code (thanks Conrad)
- Learned how to couple with Monte Carlo radiative transfer (thanks Christophe, Maya)
- PyAnalysis for analysing Phantom data in python (thanks Dave)
- Better support for CMacIonize and for storing n_e (thanks Maya, James)
- Checks for centre of mass conservation (thanks James)

WHAT WE STARTED

- A stream of wonderful 4pi videos (all)
- Dust growth in phantom (Arnaud, Esther, J-F)
- relativistic pulsar winds project (Chris, David)
- IRS48 project (Josh, Kieran, Daniel x 2)
- Cooling + winds from galactic centre (Chris, Daniel)
- Exact interpolation project (Maya, Daniel)
- Your future python-based analyses (David)
- Wider usage of MPI code (Conrad, Daniel)
- Interaction via Phantom slack channel
- Plenty of code ideas to keep me busy

THANKS

- Daniel M and Hayley for organising catering
- Sergei for sorting out website program
- Christophe, David, Sergei, Hayley, Daniel M, Kieran, Isabella for organising drinks reception
- Hayley for organising conference dinner
- Daniel P and Christophe for buying wine
- Steve Morton for recordings + conference photo
- Special thanks to everyone who flew in for the workshop
- Everyone for the stimulating week of interaction

<insert students here>



Thanks for coming!

DISCUSSION

- Annual meeting? (YES)
- Anyone want to host one? (Chris: Eclipse in Chile in July 2019? Also possibility for small workshop in Milan during DP visit in June/July 2018)
- How to best support user base? - use of mailing list, slack channel. Can we create some kind of stack-overflow type user forum?
- Host Monthly dev telecons. First Tuesday of the month, maybe linked to the release schedule? Minutes should be taken
- Resourcing of code dev tools (e.g. pipeline minutes)? Merchandise! t-shirts, mugs, hats, beach towels (don't panic + phantom), laser-cubes, keep calm and use phantom, keep cups, drink bottles
- Code releases: First ok of the month should become a release...
- Create a simulation datastore similar to the PASA datastore? Could link existing datastore from wiki page (.setup, .in, output files)
- Should create phantom data tables repository in bitbucket, so data files do not live on DP personal website