Canadian Multi-messenger Astronomy: a CFHT + GW190814 Case Study

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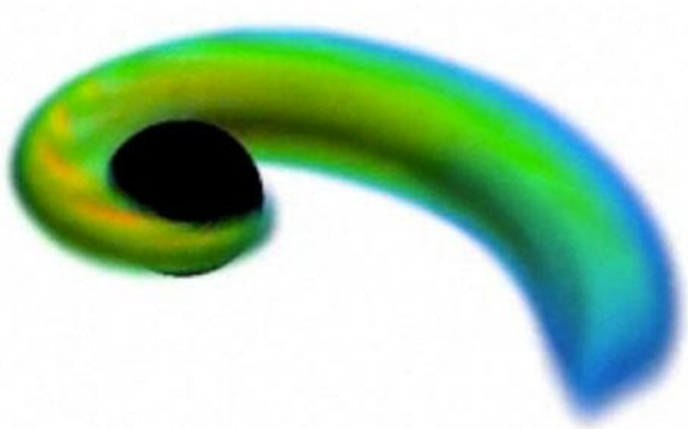
MEGA
McGill Extreme Gravity & Accretion



Institut Spatial de McGill
McGill Space Institute

CFH

Fonds de recherche sur la nature et les technologies Québec

NSERC CRSNG

GW190814

- GW190814: the first strong candidate **neutron star + black hole** (NSBH) merger with **excellent** sky localization
- Are NSBH kilonovae (UV/optical/IR transient) “redder” than binary NS?
- Implications for *r*-process synthesis of heavy elements?
- NS equation of state

A Deep CFHT Optical Search for a Counterpart to the Possible Neutron Star–Black Hole Merger GW190814

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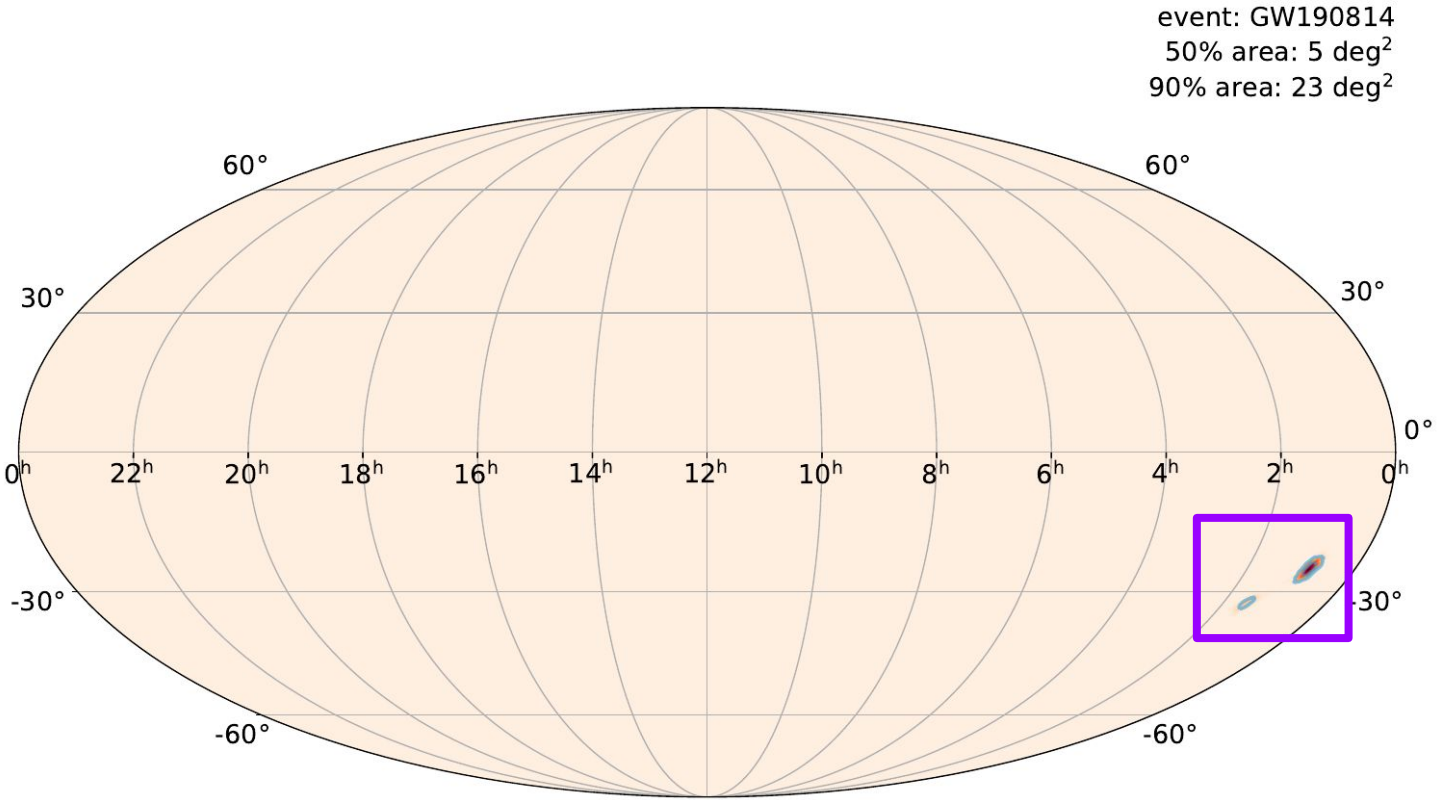
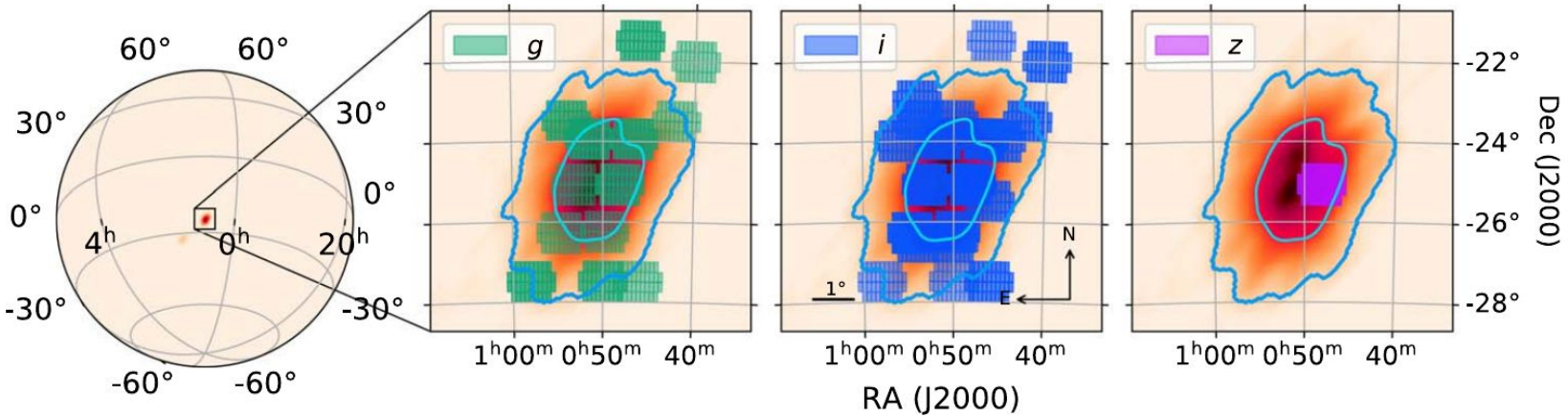
Vieira+20, ApJ 895, 96

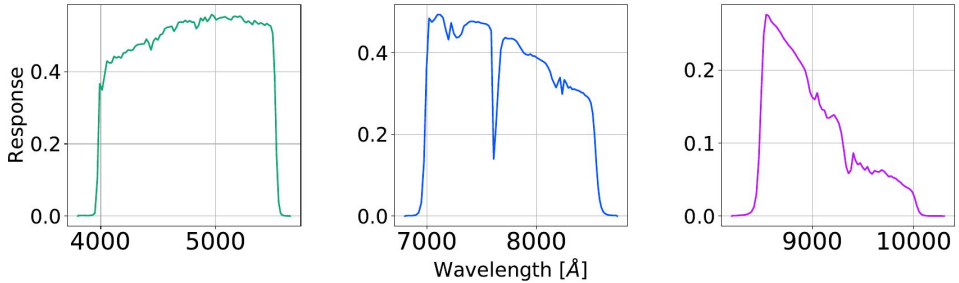
Canada-France-Hawaii Telescope (CFHT) follow-up



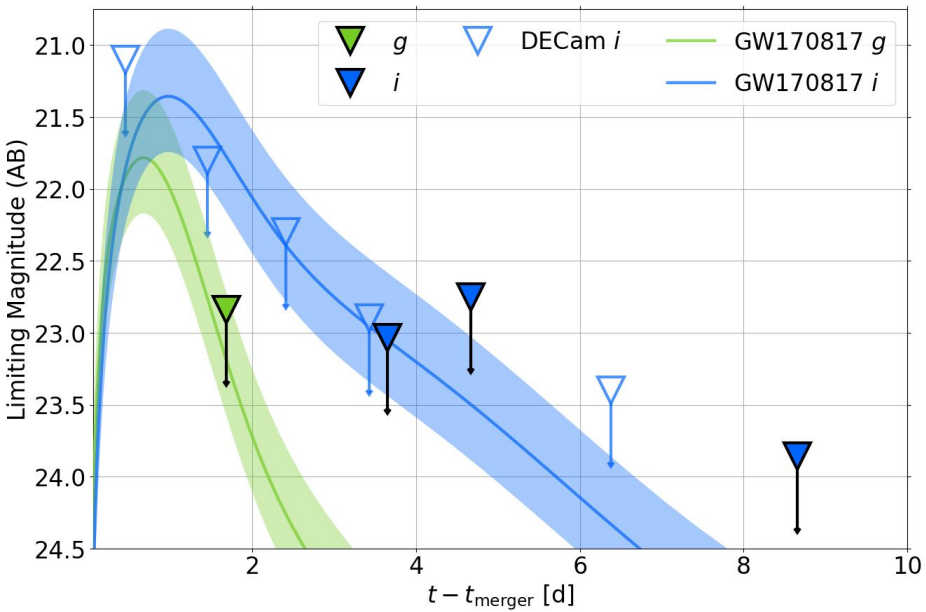
Canada-France-Hawaii Telescope (CFHT) follow-up



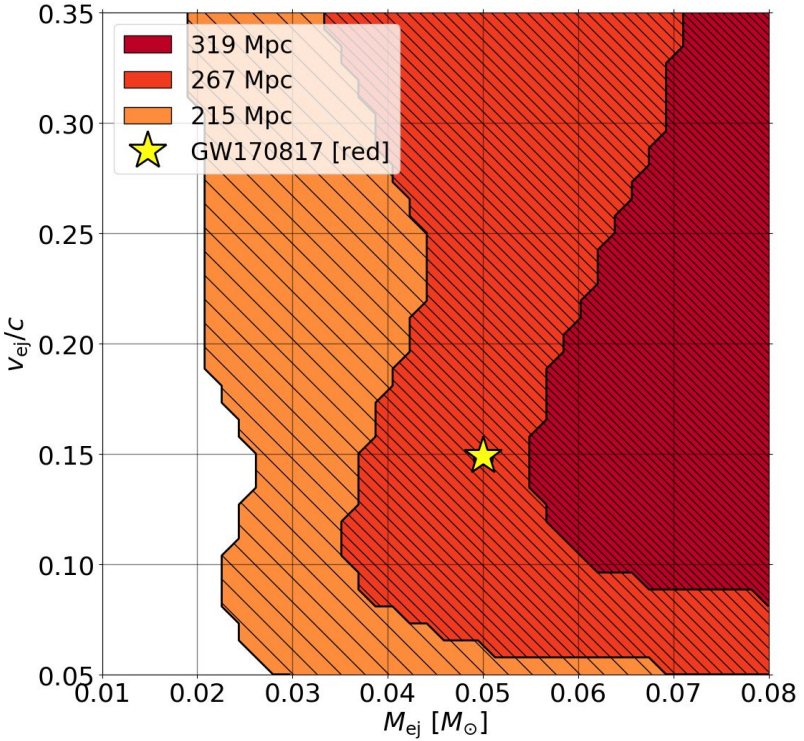
Vieira+20



Constraining the source



Vieira+20



Looking to the future

- GW190814 follow-up with CFHT: example of competitive, constraining multi-messenger astronomy led by Canadians
- Canadian expertise in multi-messenger astronomy is building!
- Excited for LISA!

Looking to the future

What will LISA data products look like?

When will they be released?

How can we ensure that we maximize science returns of LISA + EM observations?

Which existing and upcoming Canadian and Canadian-affiliated EM facilities will be most useful?

Graphic on first slide: Simulating eXtreme Spacetimes