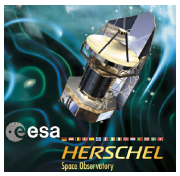
New Logo by Tim van Kempen

Highlights from DIGIT (Dust, Ice, and Gas in Time): Herschel-PACS Full Spectral Scans of Young Stars



Joel D. Green (University of Texas at Austin) and the DIGIT OTKP Team

GOALS of the DIGIT Program:
- **Follow the gas, ice, and dust from embedded through disk phases**
  - **Range of masses, luminosities**
- **Full PACS spectral scans (55-190 μm) on all embedded sources and ~ 30 of the brightest disks**
  - **Ice/dust features and some atomic/molecular lines as probes of physical structure + processing and chemical evolution**
  - **Complements existing Spitzer-IRS 5-40 μm spectra [Full 5-190 μm scans!]**
- **PACS and SPIRE photometry on fainter disks (~ 30), HIFI water (13)**

SAMPLE SELECTION:
- **Sample from Spitzer programs and others**
- **Embedded objects (31) – complementary with WISH GTKP**
- **Disks (63): cTTS, wTTS, disks with holes/gaps**

SCIENCE DEMONSTRATION PHASE:
- **Select brightest and most interesting sources for initial science verification**
- **Chose one embedded protostar and one intermediate mass young stellar object with a transitional disk**
- **Both showed evidence of many spectral diagnostics at other wavelengths**
- **Now we have obtained scans of 6 embedded protostars and 5 disk sources**

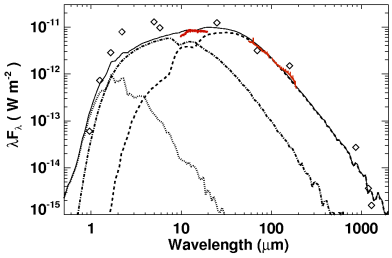
For Disk Results, see Sturm, Mulders et al. posters at this meeting.

The DIGIT Team:

Jean-Charles Augereau, Ted Bergin, Geoff Blake, Jeroen Bouwman, John Carr, Lucas Cieza, Carsten Dominik, Cornelis Dullemond, Neal Evans, Al Glassgold, Manuel Guedel, Paul Harvey, Thomas Henning, Michiel Hogerheijde, Dan Jaffe, Jes Jørgensen, Claudia Knez, John Lacy, Jeong-Eun Lee, Sebastien Maret, Bruno Merin, Lee Mundy, Joan Najita, Klaus Pontoppidan, Ewine van Dishoeck, Christoffel Waelkens, Rens Waters, Umut A. Yildiz, Odysseas Dionatos, Ruud Visser, Lars Kristensen, Joel Green, Gwendolyn Meeus, Bram Acke, Rowin Meijerink, Joanna Brown, Greg Herczeg, Tim van Kempen, Mate Adamkovics, Colette Salyk, Jo-hsin Chen, Mike Dunham, Hyo-Jeong Kim, Johan Olofsson, Bernhard Sturm, Ke Zhang, Gijs Mulders

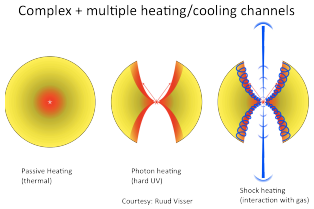
DK Cha: Emerging from its Cocoon?

See talk by van Kempen for more.

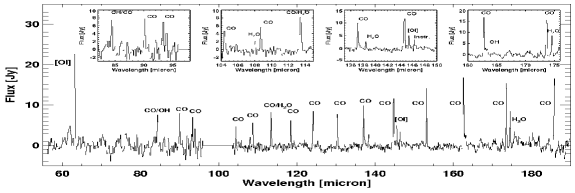


Courtesy: T. van Kempen

Embedded protostellar structure
Complex + multiple heating/cooling channels

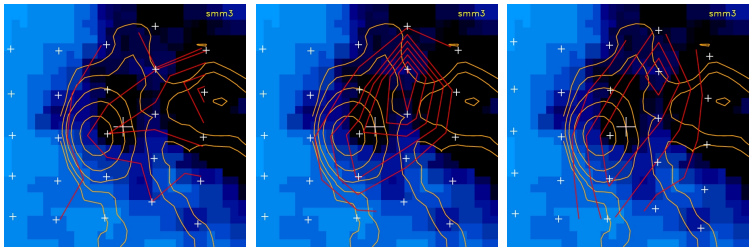


Model Properties: L = 29 L_{sol}, Compact, nearly face-on outflow, Class 0/I, M_{Disk} = 0.03 M_{sol}, M_{env} = 3 M_{sol}



Serpens SMM-3: Characterizing a Deeply Embedded Protostar

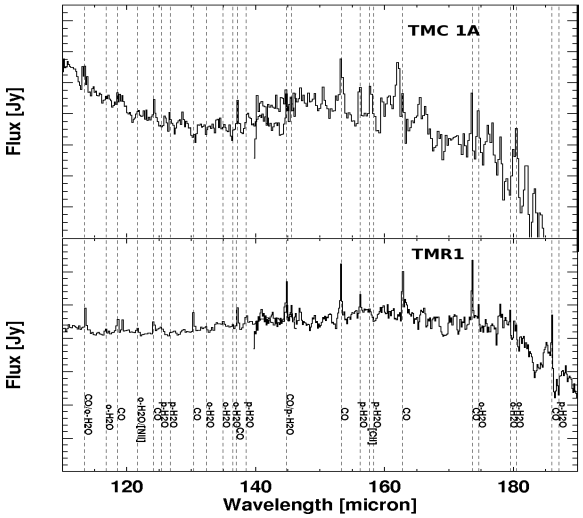
Continuum – 63 μm | [O I] (63.2 μm) | CO J=19-18 (137 μm)



Courtesy: J. Jørgensen, O. Dionatos

PACS continuum/line emission (red contours) and SHARC 350 μm continuum (orange contours) overlaid on a MIPS 24 μm image (regions of stronger emission are in black).

TMR1 and TMC1A are Rich in Gas Features



A wealth of ortho and para-H2O is seen in addition to other gas lines in embedded sources.