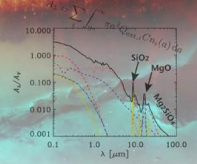
The Life Cycle of Dust in the Universe

Observations, Theory, and Laboratory Experiments

November 18-22, 2013 Taipei, Taiwan

WWW: tinyurl.com/lcod2013



This meeting aims to address the life cycle of dust in the Universe, which covers the formation, evolution and destruction of dust in a range of environments, ranging from the smallest to the largest scales. Bringing together observational and theoretical astrophysicists as well as meteoriticists and experimentalists will allow for a cross-disciplinary dialogue.

Invited Speakers
Jean-Philippe Bernard (IRAP)
Jeroen Bouwman (MPIA)
Isabelle Cherchneff (Basel)
Fred Ciesla (Chicago)
Karine Demyk (IRAP)
Loretta Dunne (Canterbury, NZ)
Hideaki Fujiwara (NAOJ)
Christa Gall (NASA GSFC)
Hiroyuki Hirashita (ASIAA)
Edward Jenkins (Princeton)
Anthony Jones (IAS)
Hidehiro Kaneda (Nagoya)
Sun Kwok (Hong Kong)
Scott Messenger (NASA JSC)
Harald Mutschke (Jena)
Nathan Smith (Arizona)
Angela Speck (Missouri)
Sundar Srinivasan (ASIAA)
Shogo Tachibana (Tokyo)
Svitlana Zhukovska (MPIA)

Conference Summary:
Thomas Henning (MPIA)

Scientific Organizing Committee
Anja Andersen (DARK)
Maarten Baes (Ghent)
Eli Dwek (NASA GSFC)
Haley Gomez (Cardiff)
Karl Gordon (STScI)
Lei Hao (Shanghai Obs)
Thomas Henning (MPIA)
Lindsay Keller (NASA JSC)
Ciska Kemper (ASIAA)
Chiyoe Koike (Ritsumeikan)
Typhoon Lee (ASIAA)
Margaret Meixner (STScI)
Vito Mennella (Obs Capodimonte)
Michiel Min (Amsterdam)
Takashi Onaka (Tokyo)
Itsuki Sakon (Tokyo)
Raffaella Schneider (Obs Roma)
Darach Watson (DARK)

Local Organizing Committee ASIAA
Tzuching Chang
Cindy Chiu
Hiroyuki Hirashita
Ciska Kemper
Lihwai Lin
Suh-Lian Lin
Ming-Chang Liu
Sheng-Yuan Liu
Ji Yeon Seok
Sundar Srinivasan
Wei-Hao Wang
Ronny Zhao-Geisler

Sponsors: ASIAA, NSC
Organizers: ASIAA, ASROC

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Cosmic Dust

Copenhagen 2018

Origins, applications & implications 11–15 June 2018

Topics: Observational constraints—Laboratory studies—Molecules and dust—Production by supernovae, massive and low-mass stars, and the ISM dust cycle—Dust in: the early universe, as a probe in galaxies, in AGN; as a tracer in the MW and local galaxies—Grain growth and planet formation and debris disks; Dust in the Solar System

Speakers: Susanne Aalto, Almudena Alonso Herrero, Mike Barlow, Kenji Bekki, John Bradley, Jan Cami, Annalisa De Cia, Ilse De Looze, Carsten Dominik, Bruce Draine, Maud Galametz, Sebastian Höning, Susanne Höfner, Akio Inoue, Cornelia Jäger, Margaret Meixner, Karin Sandstrom, Raffaella Schneider, Matt Smith, Sundar Srinivasan, Zahed Wahhaj, Gail Zasowski

SOC: Anja C. Andersen, Ann Nguyen, Daniel Asmus, Daniela Calzetti, Darach Watson (Chair), Ciska Kemper, Haley Gomez, J. D. Smith, Joao Alves, Karl Gordon, Takaya Nozawa, Thomas Henning

LOC: Anja C. Andersen, Christa Gall, Darach Watson, Francesco Valentino, Jens Hjorth, Jes Jørgensen, Sami Dib, Troels Haugbølle, Georgios Magdis

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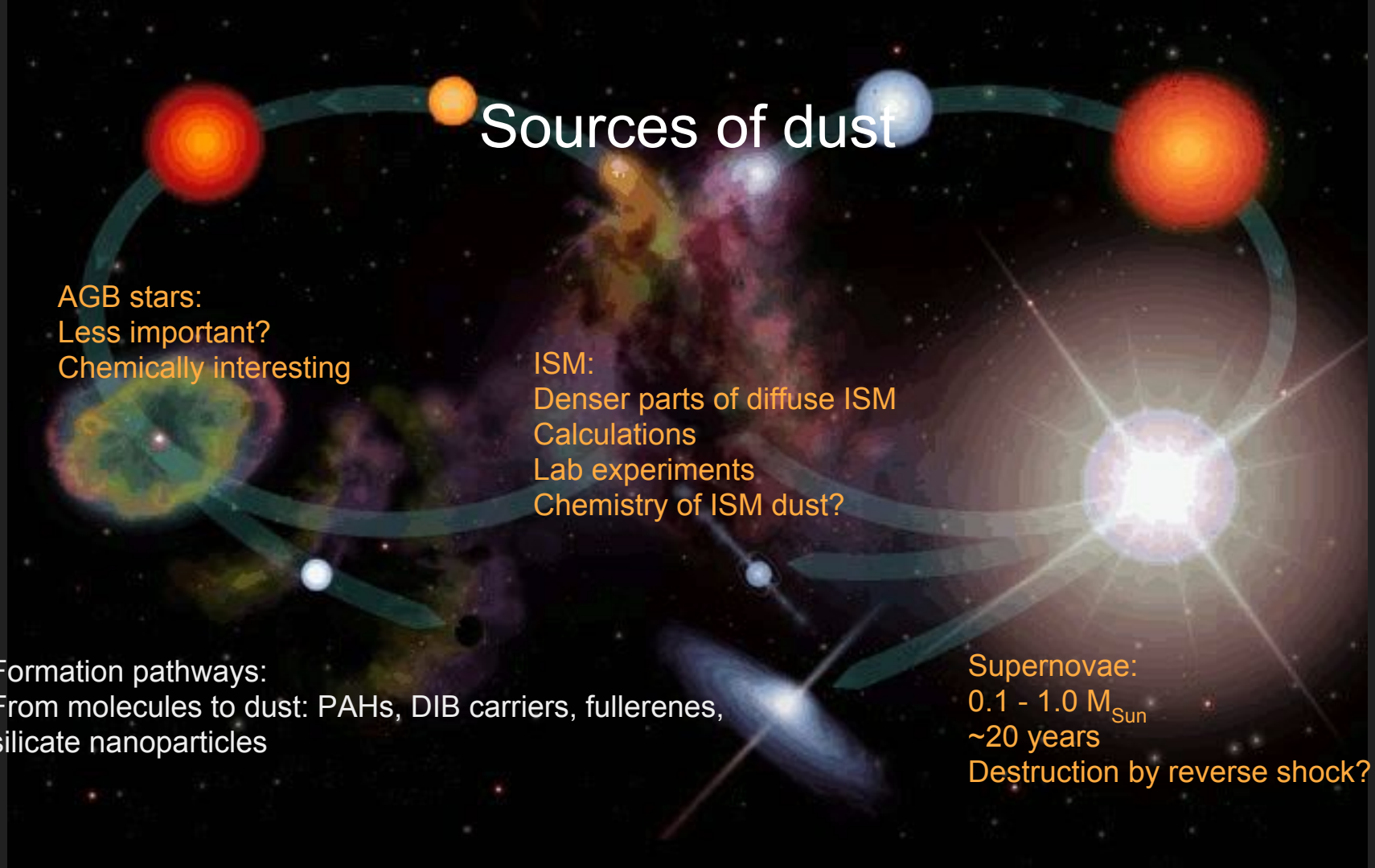
http://cphdust2018.nbi.ku.dk

Sources of dust



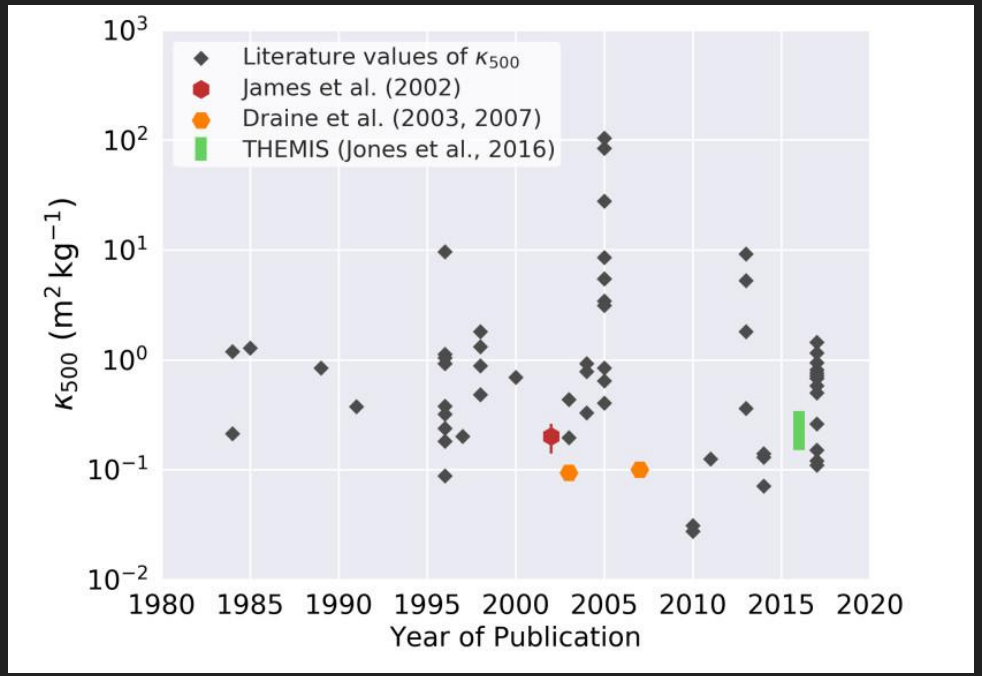
AGB stars:
Less important?
Chemically interesting

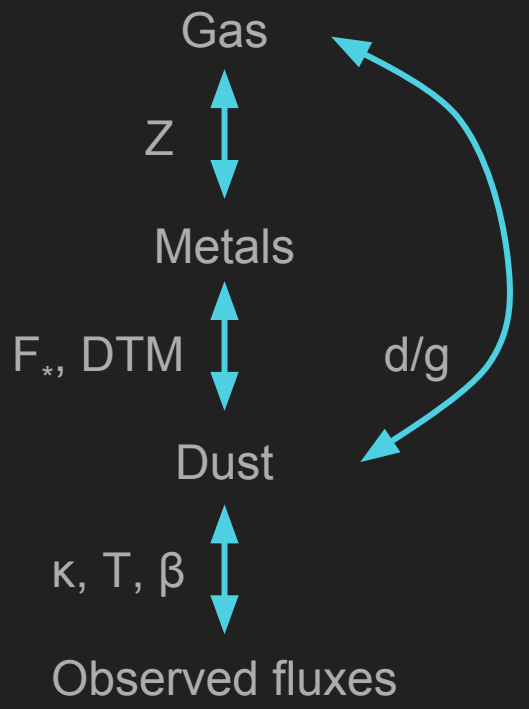
ISM:
Denser parts of diffuse ISM
Calculations
Lab experiments
Chemistry of ISM dust?

Formation pathways:
From molecules to dust: PAHs, DIB carriers, fullerenes, silicate nanoparticles

Supernovae:
0.1 - 1.0 M_{Sun}
~20 years
Destruction by reverse shock?

The dust budget





Composition & properties

Where is the iron?

Where is the oxygen?

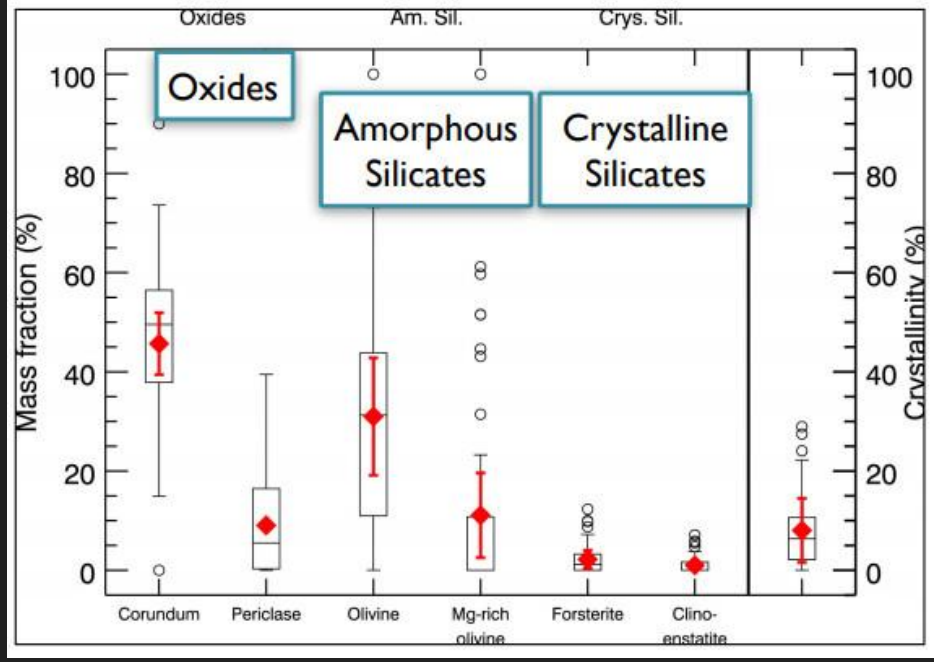
Carbonaceous/silicate ratio

Crystalline fraction of silicates

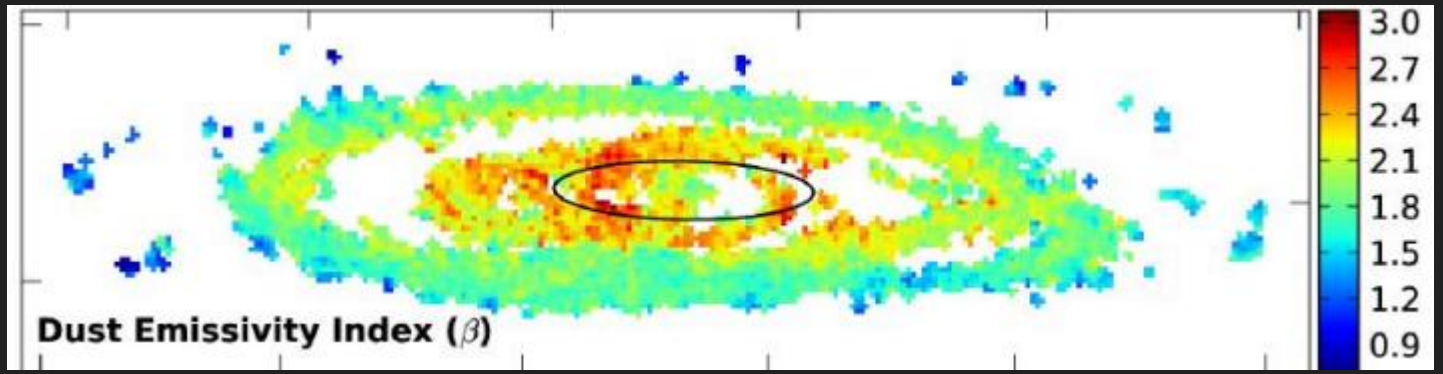
Are oxides an important dust component?

Forms of carbon

Comparison with laboratory and computational data



The wild diversity of dust in galaxies



- Trends with metallicity
- Differences from galaxy to galaxy
- Variations within galaxies

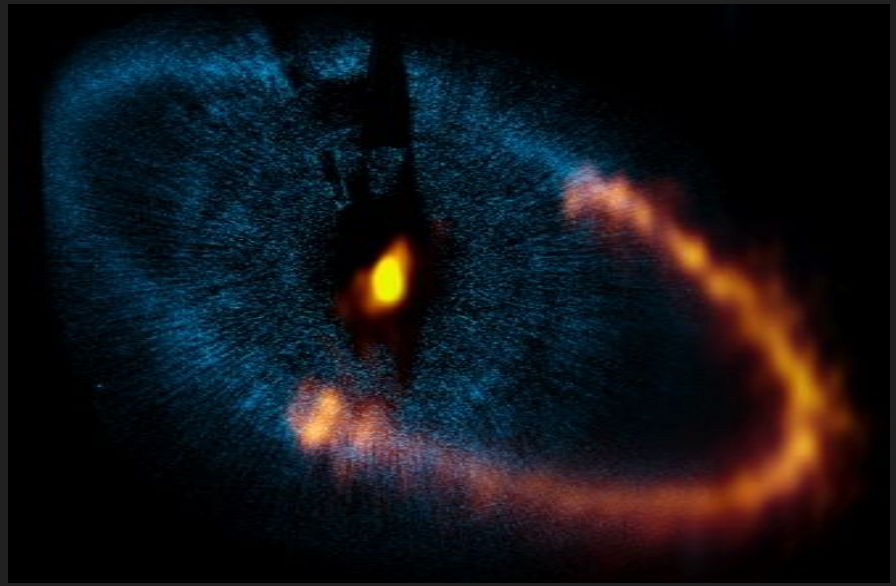
The role of dust in planet formation

How does planet formation depend on the dust properties?

Dust as a tracer to study planet formation

Is there enough dust to explain exoplanets?

How does the interstellar grain model connect to samples collected in the Solar System?



Future pathways

- Mid- and far-infrared spectroscopy; mid-IR polarimetry
  - JWST, SPICA, 30-m class, ...
- X-ray observations
  - ATHENA, …
- Optical
  - SDSS-VI; GAIA; LSST;
  - UV
- Submm
  - ALMA, single-dish, …
  - Dust masses; high-z; AME; high spatial resolution observations
- Laboratory dust astrophysics
- Computational dust astrophysics
- White paper?

Thanks

to Darach Watson & the local organizing committee

Next dust meeting:

North America, 2023