Discussion sessions

Day 1: 12 December (Mon.)

	Session 1-1: Observations	
08:30 - 09:00	Registration	
09:00 - 09:20	Welcome talk	
09:20 – 09:55	CMB and ISM interconnection in millimeter observations *	Jonathan Aumont
09:55 – 10:30	The QUIJOTE MFI wide survey: A northern sky survey in intensity and polarization at 10–20GHz *	José Alberto Rubiño-Martín
10:30 - 10:50	The C-Band All-Sky Survey (C-BASS): Overview and Intensity Results	Stuart Harper
10:50 - 11:20	Break	
	Session 1-2: Observations	
11:20 - 11:40	C-BASS Polarization Results	Richard Grumitt
11:40 - 12:00	Cosmology and foregrounds with SPT-3G	Federica Guidi
12:00 - 12:20	The Atacama Cosmology Telescope: Small Scale Structure of Galactic Dust Emission and Magnetic Fields	Rodrigo Córdova-Rosado
12:20 - 12:40	Constraints on the Optical Depth to Reionization from Balloon-Borne CMB Measurements	Josquin Errard
12:40 - 13:00	The CMB polarization telescope "GroundBIRD" - Status and future prospect	Yoshinori Sueno
13:00 - 14:30	Lunch Break	
	Session 1-3: Observations	
14:30 - 15:05	Synergies between CMB data and stellar polarimetry *	Gina Panopoulou
15:05 - 15:40	3D maps of Galactic interstellar dust *	Rosine Lallement
15:40 - 16:00	Joint End-to-End Analysis of WMAP and Planck LFI	Duncan Watts
16:00 - 16:30	Break	
	Session 2-1: Galactic science with CMB experiments	
16:30 - 17:05	Impact of foregrounds on cosmic birefringence measurements *	Patricia Diego-Palazuelos
17:05 - 17:25	Half-wave plate systematics: impact on cosmic birefringence and component separation	Marta Monelli
17:25 - 17:45	Morphological Analysis of the Polarized Synchrotron Emission with WMAP and Planck	Felice Antonio Martire
17:45 - 18:05	High resolution galactic science in the W-Band with MISTRAL	Giovanni Isopi
18:05 - 18:25	Poster Flash Talk 1	

Day 2: 13 December (Tues.)

Session 2-2: Galactic science with CMB experiments		
09:00 - 09:20	Galactic AME sources in the QUIJOTE-MFI Northern Hemisphere Wide-Survey	Frédérick Poidevin
09:20 - 09:40	Spatial variations of Anomalous Microwave Emission along the Galactic Plane	Mateo Fernández Torreiro
09:40 - 10:00	New constraints on the AME polarisation with QUIJOTE MFI in bright Galactic molecular complexes	Raul Gonzalez Gonzalez
10:00 - 10:20	New clues from Planck HFI data on the spectral dependence of dust polarization	Alessia Ritacco
10:20 - 10:40	Poster Flash Talk 2	
10:40 - 11:10	Break	
Session 2-3: Galactic science with CMB experiments		
11:10 - 11:30	Investigating the anomalous microwave emission mechanism in the S140 star-forming region	Jordan Shroyer
11:30 - 11:50	Latest results with QUIJOTE: the microwave spectra of Galactic supernova remnants	Carlos Hugo López Caraballo
11:50 - 12:10	The COMAP Galactic Plane Survey	Thomas Rennie
12:10 - 12:30	Setting large-scale constraints on polarized AME	Daniel Herman
12:30 - 13:00	Discussion	
13:00 - 14:30	Lunch Break	
	Social Event (visiting to the Teide Observatory)	

Observations (Sessions 1, 2, 3)

- What have we learnt from QUIJOTE and CBASS low frequency data?

- Synchrotron
  - Spatial variability of the synchrotron spectral index is larger than expected. The synchrotron spectrum more complicated/variable than initially thought.
  - Is polarisation fraction of the synchrotron emission lower than expected?
  - Large EE/BB~4 above 10GHz (as previously shown by WMAP/Planck). EE/BB~3 at 5GHz. Frequency dependency?
  - No TB/EB detected
  - Hints for synchrotron curvature?

- Joint e2e analysis of WMAP and Planck LFI. Adding new data: HFI and lower frequencies (CBASS, QUIJOTE)?

- High frequency observations: dust modelling. SPT-3G. ACT. Groundbird.
- Measuring the optical depth to reionization from balloon borne experiments.
- Mapping the dust complexity. Synergies with stellar polarimetry. 3D maps of galactic interstellar dust.
- TB and EB correlation for dust.

- What new data should be more useful for Galactic ISM science and for foreground correction? Higher angular resolution? More frequencies to better characterise the synchrotron/dust spectrum? What LiteBIRD data can bring in relation with Galactic ISM studies? More frequencies than Planck will of course help, but with coarser angular resolution.

Galactic Science and CMB experiments (Sessions 1,2,3)

- Cosmic birefringence. How to test the subtraction of the Galactic foreground contribution?
- Upper limits of AME polarization. Where should we look at? What environments? Maybe need better angular resolution? Shall we still care about the impact of AME on B-modes detection? Would a possible AME polarised component be absorbed in the synchrotron curvature term? Diffuse emission?
- AME modelling. Phenomenological (3-parameter log-log parabola, Stevenson et al. 2014) versus physical models (spdust).
- AME carriers. Preference for PAHs from Mateo et al. What additional observations are needed?
- Dust polarization spectral dependence. Impact on birefringence data analysis?

Day 3 Discussion

Day 3: 14 December (Wed.)

Session 3-1: ISM & GMF		
09:00 - 09:35	Modeling the Galactic Magnetic Field *	Marijke Haverkorn
09:35 - 10:10	Simulating the interstellar medium from star-forming regions to galactic outflows *	Philipp Girichidis
10:10 - 10:45	3D Views of Interstellar Magnetic Fields *	Mehrnoosh Tahani
10:45 - 11:15	Break	
Session 3-2: ISM & GMF		
11:15 - 11:35	Magnetic fields in Galactic halo bubbles and UHECR propagation	Vasundhara Shaw
11:35 - 11:55	Modeling of the Galactic Magnetic Field with Synchrotron Observations	Elena Orlando
11:55 - 12:15	Starlight-polarization-based tomography of the dust polarization sky	Vincent Pelgrims
12:15 - 12:35	Observing Inflation through Galactic foregrounds	Paolo Campeti
12:35 - 12:55	The First 3n 3D Map of Galactic Dust Temperature	Ioana Zelko
12:55 - 14:25	Lunch Break	
Session 3-3: ISM & GMF		
14:25 - 15:00	The nature of the multi-phase interstellar medium *	Marc-Antoine Miville-Deschenes
15:20 - 15:20	The Other Planck Constant	Jean-Marc Casandjian
15:20 - 15:40	Magnetic Misalignment of Interstellar Dust Filaments	Ari Cukierman
15:40 - 16:00	Probing the Morphology of HI Phase Structures using the Scattering Transform	Minjie Lei
16:00 - 16:30	Break	
Session 4-1: FG modelling		
16:30 - 17:05	Non-Gaussian foreground modeling with scattering transforms *	Erwan Allys
17:05 - 17:25	Morphological Statistics of Galactic Synchrotron Emission	Fazlu Rahman
17:25 - 17:45	Diffuse polarized foregrounds from component separation with QUIJOTE-MFI	Elena de la Hoz
17:45 - 18:15	Discussion	
20:00 -	Social Dinner	

ISM & Galactic Magnetic Field (Sessions 3-1,2,3)

- The promise of a 3D ISM
  - How can we predict dust and synchrotron properties at CMB frequencies using available 3D data?
  - What are synergies between datasets that need to be explored? What predictions could be made/tested?
- The HI-Dust Connection
  - What are prospects for improving HI-based models of dust emission? E.g., tau/NH in different regions of the galaxy, HI phase decomposition, HI morphology…?
  - How can insights from magnetic misalignment inform cosmic birefringence analyses? What outstanding questions remain about the magnetic misalignment model and what are prospects for answering them?
- Understanding Galactic Synchrotron Emission
  - How can MHD simulations inform expectations for changes in the synchrotron frequency spectrum, scale dependence, correlation with dust, EE/BB…? How can these insights be incorporated into foreground simulations?

Foreground Modeling (Session 4-1)

- Statistical Characterization of Galactic Foregrounds
  - We have been trying to understand foregrounds in terms of EE, BB, etc. inherited from CMB. Is there a more natural set of statistics? If so, how do we connect back to B-modes?
  - How can these statistical characterizations help us understand how and why Galactic emission varies across the sky, either in amplitude (e.g., correlations with fCNM or tau/NH) or in frequency spectrum (e.g., T, beta)?
- From Characterization to Simulated Maps
  - What are the steps needed to implement realistic, physically plausible maps of polarized dust and synchrotron emission on small scales using this statistical understanding?

Day 4 Discussion

Day 4: 15 December (Thur.)

Session 4-2: FG modelling		
09:00 - 09:35	Characterization of Foreground emission for CMB experiments: current status and future prospective *	Nicoletta Krachmalnicoff
09:35 - 09:55	Characterizing Dust Polarization Through Correlations with Neutral Hydrogen	George Halal
09:55 - 10:15	The Planck Legacy Archive: present and future	Marcos López-Caniego
10:15 - 10:35	The North Galactic Spur as seen by QUIJOTE-MFI	Bob Watson
10:35 - 10:55	Extended Delta-map: a map-based foreground removal method for CMB polarization observations	Yuto Minami
10:55 - 11:25	Break	

Session 5-1: Component separation techniques		
11:25 - 12:00	Applications of the Moment Expansion Method in Cosmology *	Jens Chluba
12:00 - 12:35	Challenges for measurement of CMB spectral distortions - Current Status and Outlook *	Aditya Rotti
12:35 - 12:55	High precision modeling of polarized signals: moment expansion method generalized to polarization	Léo Vacher
12:55 - 14:25	Lunch Break	

Session 5-2: Component separation techniques		
14:25 - 15:00	CMB component separation techniques *	Matthieu Remazeilles
15:00 - 15:20	Application of Bayesian Inference to disentangle CMB foregrounds	Tuhin Ghosh
15:20 - 15:40	Multi-Clustering Needlet-ILC for CMB B-mode component separation	Alessandro Carones
15:40 - 16:00	Component Separation for PICO and r-Forecasts	Shaul Hanany
16:00 - 16:30	Break	

Session 5-3: Component separation techniques		
16:30 - 17:05	Parametric component separation with clustering techniques *	Giuseppe Puglisi
17:05 - 17:25	Detecting the CMB B-mode through foregrounds: a hybrid component separation approach	Susanna Azzoni
17:25 - 17:45	Recovering the CMB signal with neural networks	José Manuel Casas

Session 6: Conclusions		
17:45 - 18:30	Final Discussion & Conclusion	

Foreground Modeling (Session 4-2) and Component separation (5-1, 5-2, 5-3)

- PanEx & New Information: plan to process new information in sky models? Which new features with respect to PySM3? Series of JCs post-conference? Sub-teams for specific tasks? PanEx Meeting in some time to discuss the modeling progresses?
- Large Scale Synchrotron Spectral Index: Combination of Patterns from CBASS, QUIJOTE & SPASS?
- FG EB, TB Cross-Correlation, direction dependence?
- Frequency dependency of the EE/BB ratio, what is the path ahead?
- PySM versus PSM. PSM is more complete because it includes more components. In this sense both could be regarded as complementary.
- Can current foreground models be considered obsolete (see Mathieu's talk)? Are extended models (accounting for foreground spectral distortions) needed now, or will they be needed soon, given the data landscadpe?
- Are accurate astrophysical models of foregrounds really needed for robust CMB recovery, or should we prefer effective modelling of foregrounds with e.g. moments?
- How to get evidence of possible foreground mismodeling and spurious detection of r? Do we have reliable strategies to validate or invalidate a detection of r?