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## Searching for primordial B-modes through the foreground and systematics fog using future CMB space telescopes

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Inflation was introduced to take care of the flatness and horizon problem in Cosmology. Through the past 3 decades of CMB observation, it has become the leading theory to explain the generation of primordial matter fluctuations during the first moments of the Universe. A major prediction of Inflation is the generation of primordial gravitational waves which will show itself as tiny fluctuations in the CMB polarisation signal. It has, however, remained elusive till now. A 4th generation space telescope, such as LiteBIRD, aims to probe the CMB polarisation signal at a sensitivity of  $1e-3$  on the tensor to scalar ratio. Reaching such sensitivities is not trivial as the CMB signal is shrouded by emissions from our own galaxy, and spurious signals due to uncertainties in instrumental parameters. In the upcoming era of low signal/noise CMB analysis, it is critical to mitigate these biases to be able to reach the desired sensitivity. I talk about current efforts in modelling the astrophysical foregrounds and possible systematic effects, and the methods we use to extract the underlying CMB signal.