

Data Science Analysis Assignment - 8

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Q1.

In [4]:

```
#importing required libraries
import pandas as pd
import numpy as np
from matplotlib import pyplot as plt
from astroML.correlation import bootstrap_two_point_angular

#adjusting plots to a textbook feeling
if "setup_text_plots" not in globals():
    from astroML.plotting import setup_text_plots
    setup_text_plots(fontsize=14, usetex=False)

#importing data
data = pd.read_csv("D:\\CLASSES\\SEM 4\\Data Science Analysis\\A8\\data.csv", sep="\s+")

#r-mag cuts
data = data[data['r-mag'] > 17]
data = data[data['r-mag'] < 20]

#making sure spread_model > 0.002 for galaxies in Blanco Cosmology Survey
m_sm = 0.002
data = data[data['spread_model'] > m_sm]

#given
Nbins=16
Nbootstraps=10

#defining bins and bin_centers
bins = 10 ** np.linspace(np.log10(1 / 60.), np.log10(1), Nbins)
#bins = np.log10(np.logspace((1/60.), 1, 16))

bin_centers = 0.5 * (bins[1:] + bins[:-1])

#bootstrap resampling
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```

results = bootstrap_two_point_angular(data['RA'],data['DEC'],bins=bins,method='landy-szalay',Nbootstraps=Nbootstraps)
corr, err_corr, bootstrap = results

#plotting the function
fig = plt.figure(figsize=(10, 6))
plt.grid()

plt.errorbar(x = bin_centers, y = corr, yerr = err_corr, fmt = ".k")
plt.yscale('linear')
plt.xscale('log')

plt.title("Angular Two-point correlation function of galaxies", fontsize = '20')
plt.xlabel(r'$\theta$ (deg)',fontsize = 16)
plt.ylabel(r'$\hat{w}(\theta)$',fontsize = 16)

plt.show()

```

