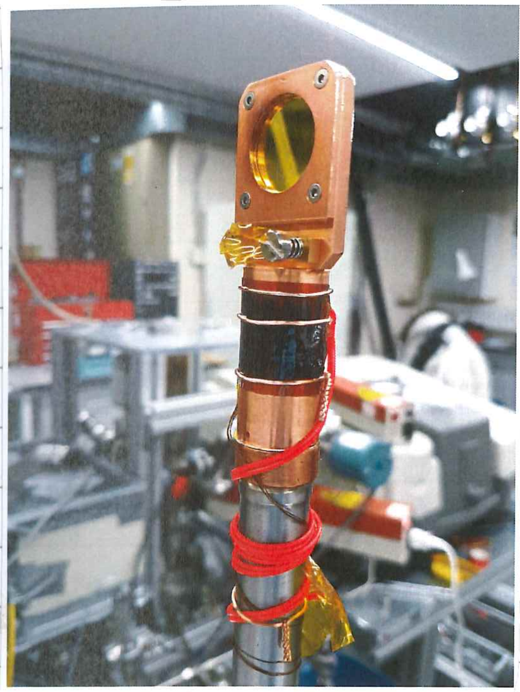
Updated python code for benzene, to constrain refractive index

```
from scipy.optimize import curve_fit
import numpy as np
import matplotlib.pyplot as plt

print("Enter data file include full filename and extension e.g. T44026.dat")
filename=input()
x,y = np.loadtxt(filename, dtype=float, usecols=(0,1), unpack=1, skiprows=2)
if np.any(y < 0):
    y = -1*y

#sin function used y0+sin(2pi(x-xc)/w)
#with y0=y-offset=A(n+1)/(n-1); xc=x-offset/phase, w=period, A=amplitude
def intento(x,*p):
    A, xc, w, n=p
    return A*((n+1)/(n-1)+np.sin(2*np.pi*(x-xc)/w))
guess =[0.01, -600, 1000, 1.4]

#parameter bounds
width = 1200
param_bounds=([0,-width/2, -width, 1.4],[0.1, +width/2, width, 1.5])

#fits the funtion and returns coeff[as many guesses as you have]
coeff, var_mat = curve_fit(intento, x, y, p0=guess, bounds=param_bounds,\
                    maxfev=10000)

#chi squared calculation
chi_squared = np.sum(((y-intento(x,*coeff))**2)/(intento(x,*coeff)) )

#plots:
plt.plot(x, y, '.', label='data' )
plt.plot(x, intento(x,*coeff),'r-', label='Fit')
plt.xlabel('Time (s)')
plt.ylabel(r'Diode Current ($\mu$A)')
plt.show()

A=coeff[0]; xc=coeff[1]; w=coeff[2];n=coeff[3]
y0=A*(n+1)/(n-1)

print("Chi-sq =", chi_squared, "\n")
print("y0 =", y0, "\nxc =", xc, "\nw =", w, "\nA =", A)
print ("\nRefractive index =",n, "at 632.8 nm")

#n1*sin(theta1)=n2*sin(theta2), So theta2=arcsin(sin(20deg)/n2)
theta=np.radians(20)            #Attention, python numpy works in radians
theta2=np.arcsin(theta/n)
theta2_deg=np.rad2deg(theta2)
print ("\ntheta2 =", theta2, "rad \ntheta2 =", theta2_deg, "degrees")

#thickness per fringe, d = lambda(632.8)/2*n2*cos(theta2)
d=632.8/(2*n*np.cos(theta2))
print ("\nd =", d, "nm")

#rate = thickness/fringe / time/fringe
rate=d/w
print ("\nDeposition rate =", rate, "nm/s")

t= float(input('Enter deposition time in seconds: '))

thickness=rate*t
print ("\nThickness =", thickness, "nm")
```


Changed the heater today.

12/12/17



Replaced burnt heater & showed Rachel.

Needed to rewire feedthrough as one of the heater wires broke off the pin.

~~Rewired~~ Re-wound the wires for ease of access to feedthrough if we need to get at the pins in the future.

We got ASTRID2 beamtime!

PI : ISA-18-115

VUV photoabsorption spectroscopy of benzene and water in argon matrices and astrophysically relevant conditions

Co-I : ISA-18-114 (Andrew)

Investigation into the nature of spontelectrics using VUV abs. spectroscopy

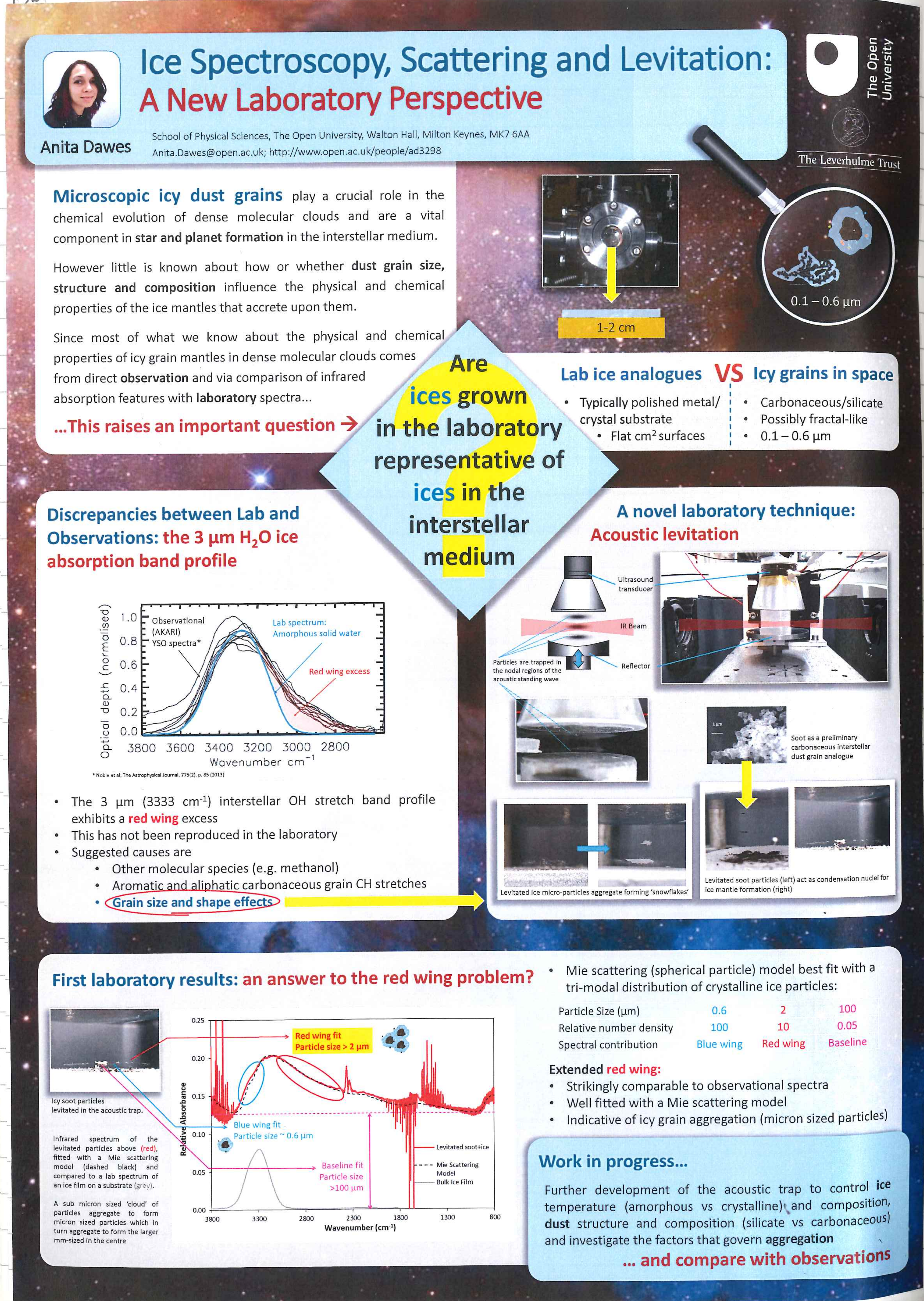
Co-I : ISA-18-116 (Rachel)

Systematic VUV studies of electron-irradiated, condensed molecular films of CO_2 : NH_3

SCHEDULE

April				May				June			
S	01			T	01			F	01		
M	02		14	W	02			S	02		
T	03			T	03			S	03		
W	04			F	04			M	04		23
T	05			S	05	Sergio's		T	05		
F	06			S	06	Experiments		W	06		
S	07			M	07		19	T	07		
S	08			T	08			F	08		
M	09		15	W	09			S	09		
T	10	Setting chamber up		T	10			S	10	Bhala's Experiments	
W	11			F	11			M	11		24
T	12			S	12			T	12		
F	13			S	13			W	13		
S	14			M	14		20	T	14		
S	15	Spontelectric Experiments		T	15			F	15		
M	16		16	W	16			S	16		
T	17			T	17			S	17		
W	18			F	18	Other part of Rachel's		M	18		25
T	19			S	19	Experiments		T	19		
F	20			S	20			W	20		
S	21	Part of Rachel's Experiments		M	21		21	T	21		
S	22			T	22			F	22		
M	23		17	W	23	Anita's		S	23		
T	24			T	24	Experiments		S	24		
W	25	SGM4		F	25			M	25		26
T	26	UB from 15:00		S	26			T	26		
F	27			S	27			W	27		
S	28			M	28		22	T	28		
S	29			T	29	SGM4		F	29		
M	30		18	W	30			S	30		
				T	31						
	18	work days excl. 4 Sat.			21	work days excl. 4 Sat.			19	work days excl. 5 Sat.	

EWASS Week: 04-05 April Poster Presentation



ASTRID2 Beamtime! 09/04/18

Dates I was there:

09/04 – 12/04 Set up + start of Spontelectric week.
Spontelectric week 11/04 – 18/04

17/04 – 23/04 Rachel's week I 19/04 – 23/04

16/04 – 28/04 Rachel's week II 16/04 – 20/04
My week 21/04 – 28/04

Rachel's week

Pure CO_2 irradiated + unirradiated

Pure NH_3 " "

$NH_3 + CO_2$ " "

PTO

My week →