

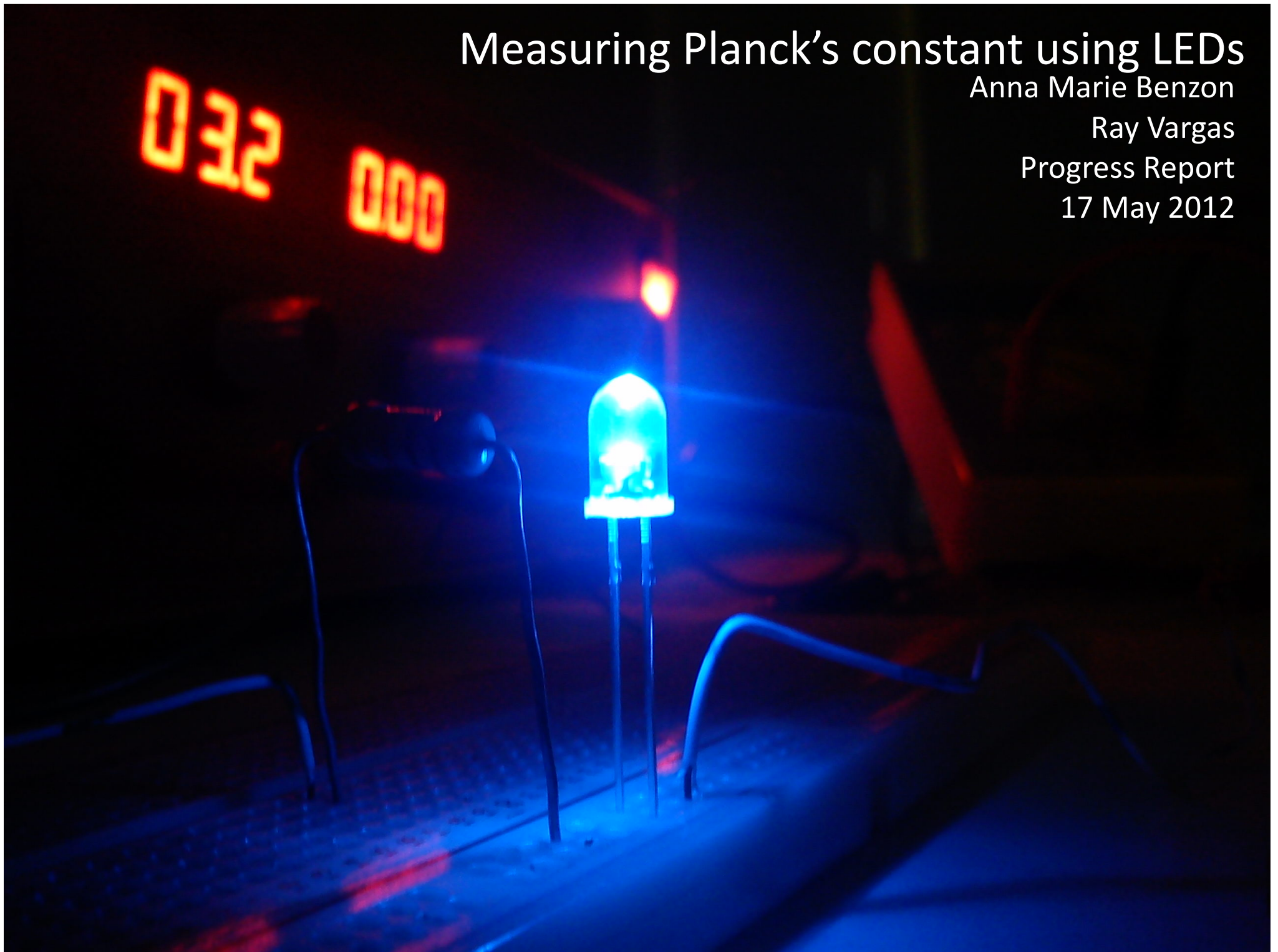
Measuring Planck's constant using LEDs

Anna Marie Benzon

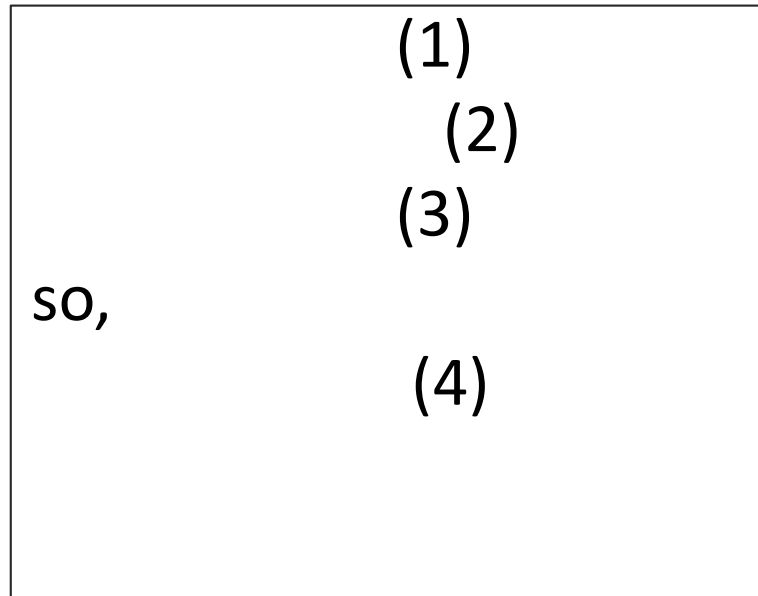
Ray Vargas

Progress Report

17 May 2012



Recall.



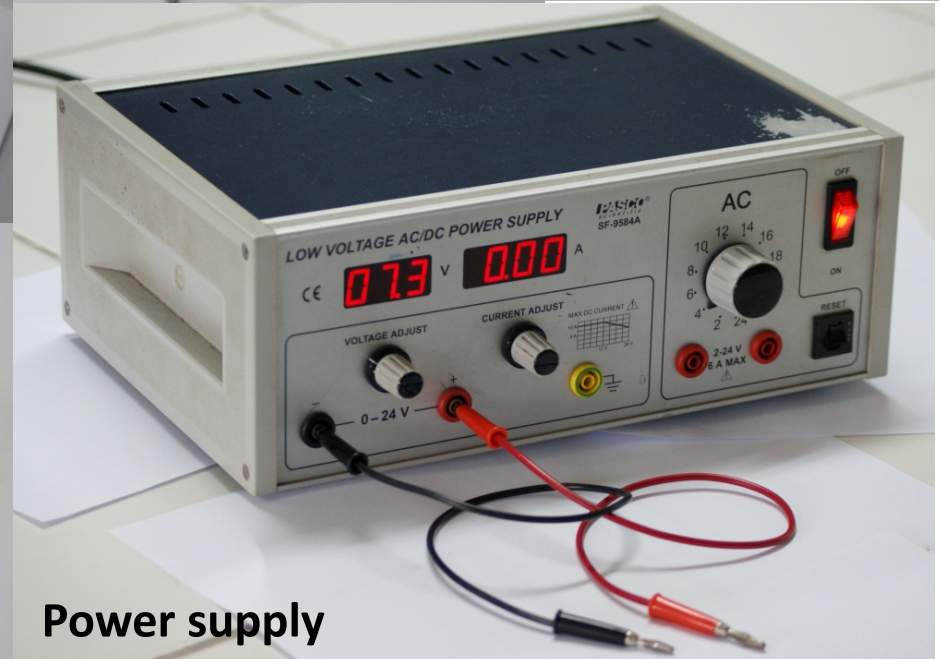
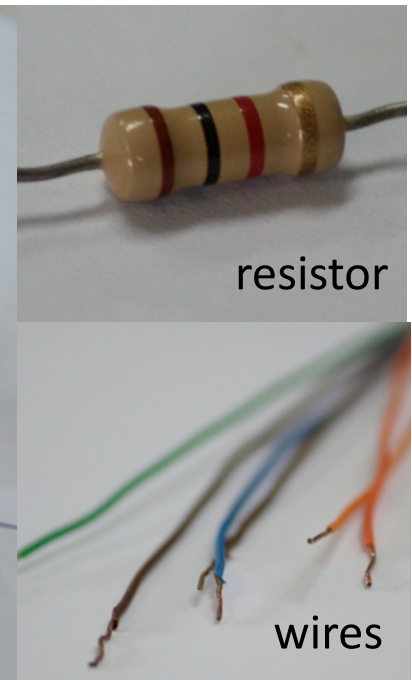
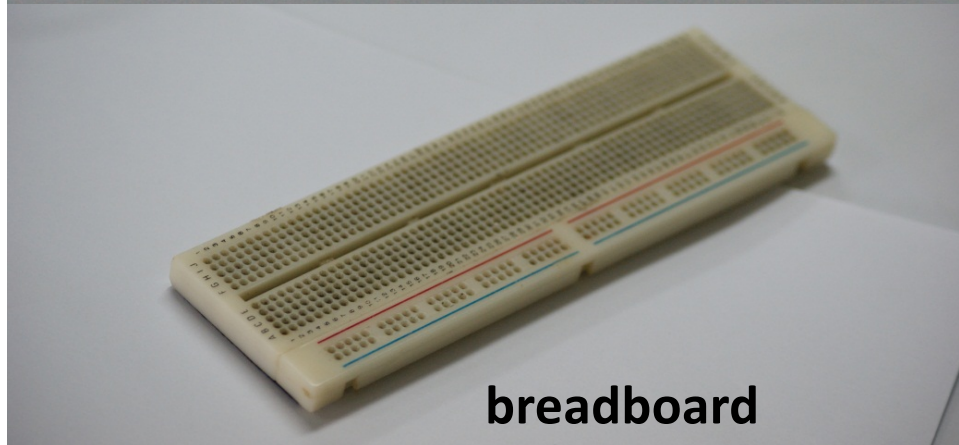
E - Energy of the photon with frequency f .

h – Planck's constant

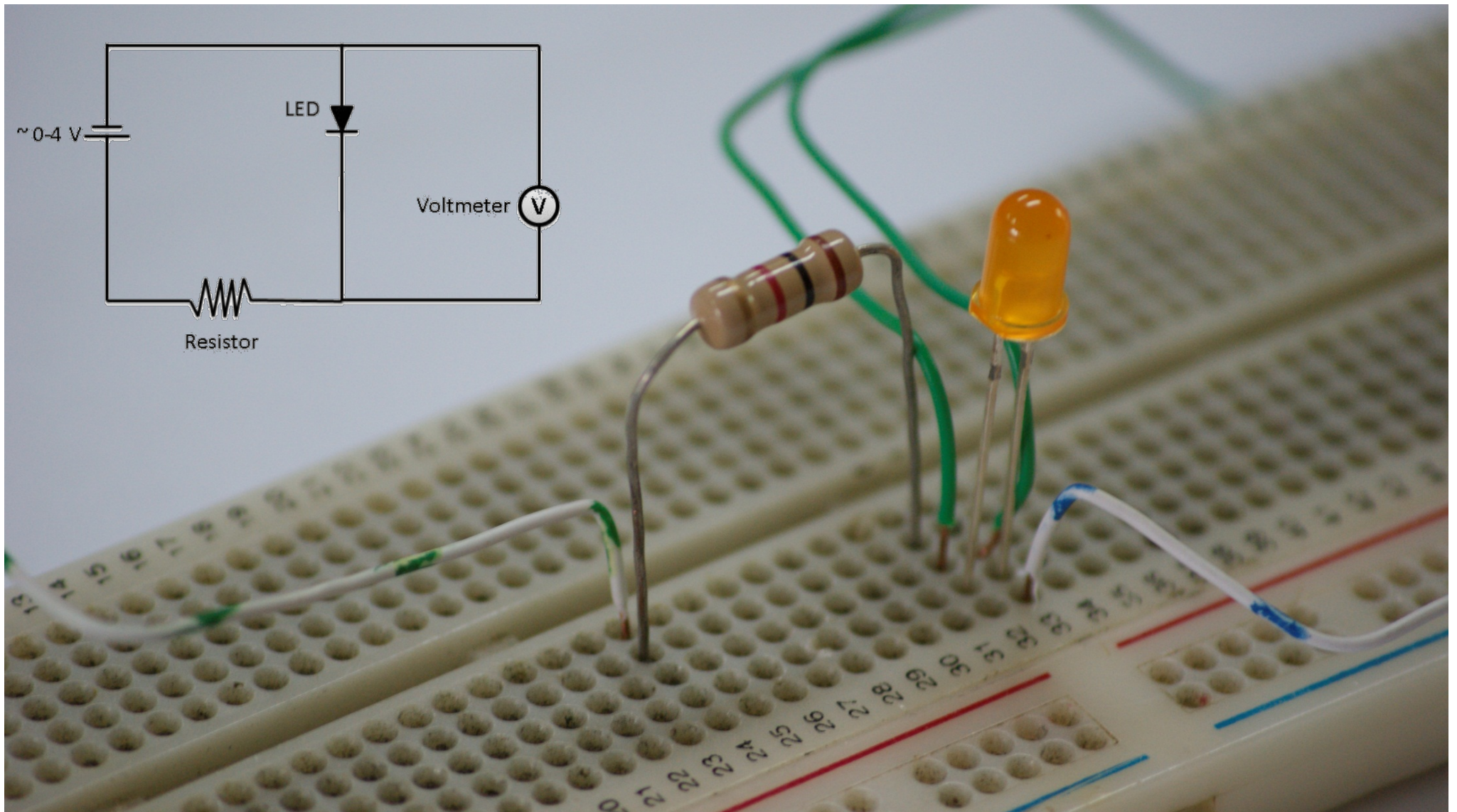
e – charge of electron

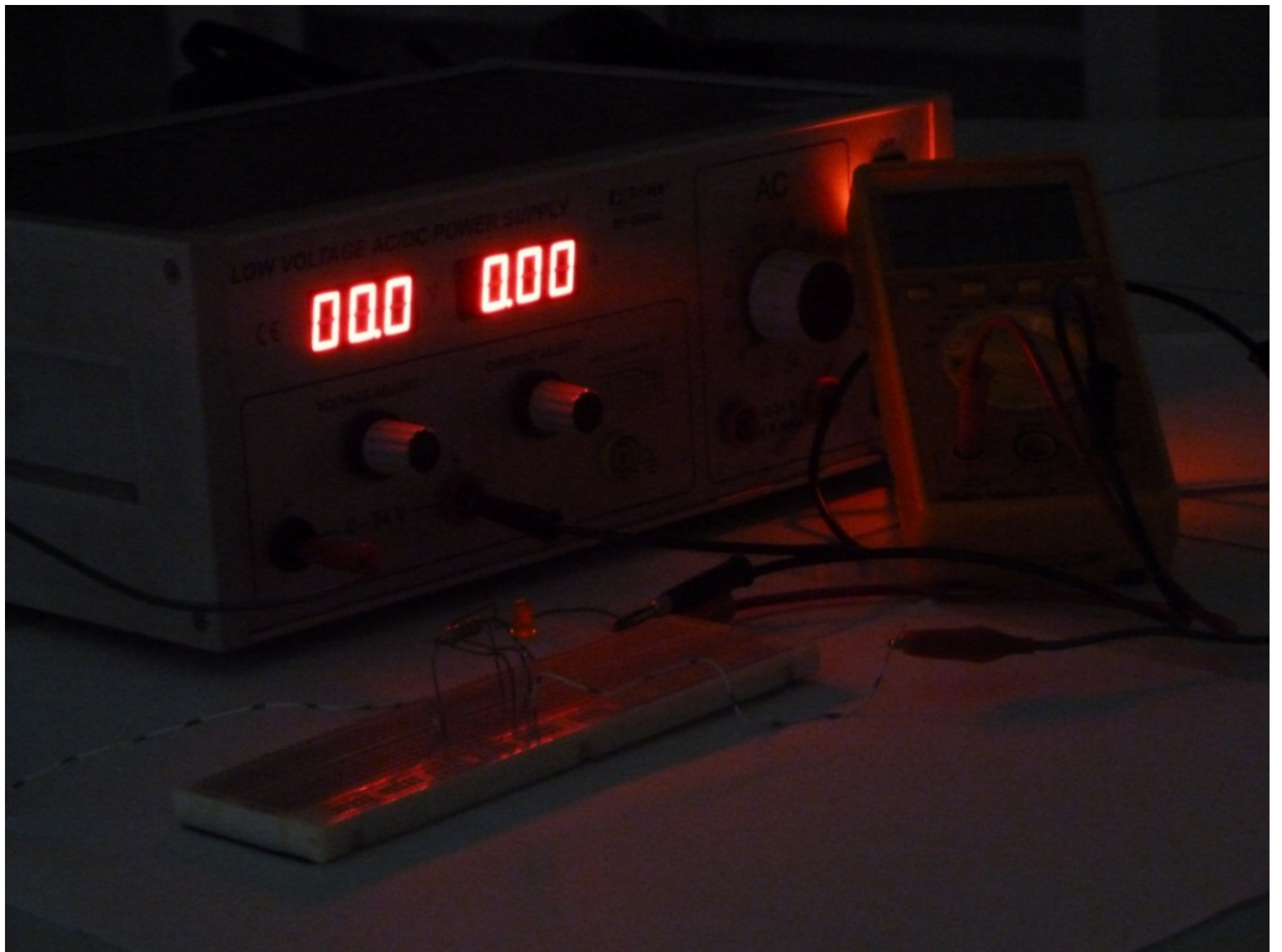
V – voltage across p-n junction in LED to recombine holes and electron and emit photon with frequency f .

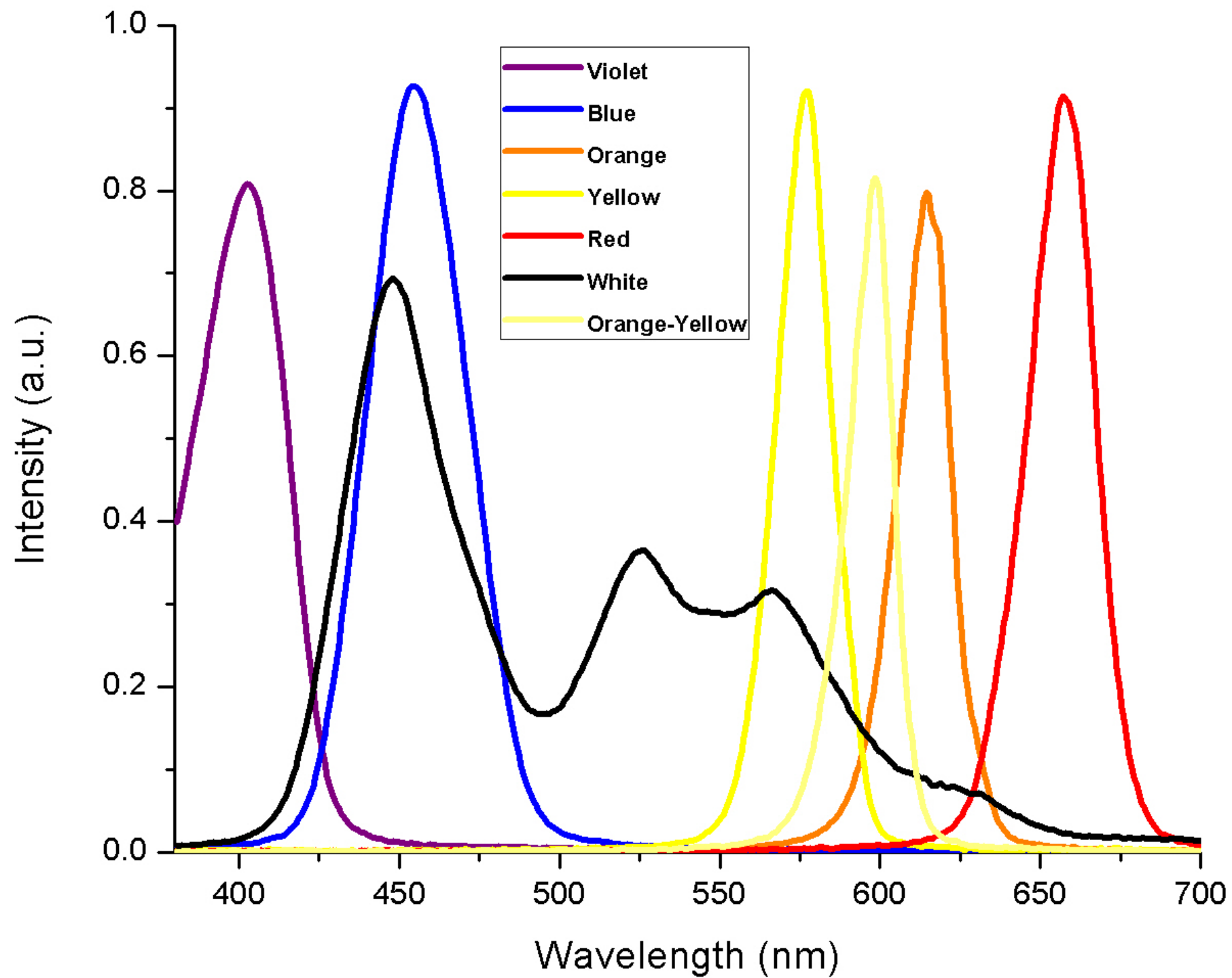
Figure 1. Materials needed for measurement of Plancks Constant measurement.



Set up







LED	Vo [V]	Wavelength [nm]	c	e	h			error	
Red1	1.464	6.572E-07	3E+08	1.60E-19	5.13E-34	6.63E-34	1.49E-34	0.225035	22.50353
Red2	1.462	6.572E-07	3E+08	1.60E-19	5.13E-34	6.63E-34	1.50E-34	0.226094	22.6094
Orange	1.542	6.144E-07	3E+08	1.60E-19	5.06E-34	6.63E-34	1.57E-34	0.236905	23.69045
Yellow1	1.695	5.774E-07	3E+08	1.60E-19	5.22E-34	6.63E-34	1.40E-34	0.211703	21.17032
Yellow2	1.737	5.774E-07	3E+08	1.60E-19	5.35E-34	6.63E-34	1.27E-34	0.19217	19.21701
Blue1	2.287	4.543E-07	3E+08	1.60E-19	5.55E-34	6.63E-34	1.08E-34	0.163141	16.31412
Blue2	2.452	4.543E-07	3E+08	1.60E-19	5.95E-34	6.63E-34	6.81E-35	0.102764	10.27644
Blue Big	2.467	4.543E-07	3E+08	1.60E-19	5.98E-34	6.63E-34	6.45E-35	0.097276	9.727558
Green1	1.725		3E+08	1.60E-19	0.00E+00	6.63E-34	6.63E-34	1	100
Green2	2.768		3E+08	1.60E-19	0.00E+00	6.63E-34	6.63E-34	1	100
Green Big	2.159		3E+08	1.60E-19	0.00E+00	6.63E-34	6.63E-34	1	100
Violet	2.754	4.02E-07	3E+08	1.60E-19	5.91E-34	6.63E-34	7.17E-35	0.10827	10.82702
Ultraviolet	2.812		3E+08	1.60E-19	0.00E+00	6.63E-34	6.63E-34	1	100
White	2.495	0.000000447	3E+08	1.60E-19	5.95E-34	6.63E-34	6.74E-35	0.1017	10.17

