

# A SEARCH FOR OPTICAL-UV FADING OF CENTRAL STARS

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**Abstract.** We derive estimates of the masses of planetary nebulae central stars (CSPN), based on their rate of optical-UV fading.

As a central star evolves to higher temperatures, a decreasing fraction of its light is emitted in the optical-UV region of the spectrum. The rate of fading is extremely sensitive to the stellar mass. After reprocessing early IUE spectra and correcting later spectra for the known rate of camera sensitivity degradation (Garhart 1992, *IUE Newsletter*, 47), we are able to detect evidence of fading in a number of C-SPN at a level greater than the minimum detection threshold ( $\sim 4\%$ ). The first five columns in the following Table list the star and its type, photometric variability characteristics (Bond 1992, priv. comm.), temperature (in kK), and number of IUE spectra used. The sixth column lists the the mean rate of fading in select- ed wavelength bands free of nebular emission and camera defects. The last two columns show the corresponding stellar masses, calculated by interpolating within the hydrogen-burning sequences of Wood and Faulkner (1986, *Ap. J.*, 307, 659: W & F) and Blöcker and Schönberner (1990, *Astron. Astrophys.*, 240, L11: B & S), respectively.

Central Star	Type	Var?	T <sub>3</sub>	N <sub>SWP</sub>	Fading Rate (%/decade)	Mass (M <sub>⊙</sub> ) W & F	Mass (M <sub>⊙</sub> ) B & S
BD +30 3639	WC9	—	26:	4	+3.3 ± 1.6	—	—
He 2-131	O7f-eq	—	27	2	-4.1 ± 2.4	0.74 <sup>+0.05</sup> <sub>-0.05</sub>	0.71 <sup>+0.03</sup> <sub>-0.05</sub>
He 2-138	BC OIa	—	27	3	-8.1 ± 1.2	0.78 <sup>+0.04</sup> <sub>-0.04</sub>	0.74 <sup>+0.02</sup> <sub>-0.02</sub>
NGC 40	WC8	Irreg.	31:	3	-4.1 ± 1.5	0.73 <sup>+0.02</sup> <sub>-0.03</sub>	0.70 <sup>+0.02</sup> <sub>-0.03</sub>
IC 418	O6f	"	36	5	-8.9 ± 3.3	0.77 <sup>+0.03</sup> <sub>-0.03</sub>	0.73 <sup>+0.02</sup> <sub>-0.03</sub>
IC 4593	O7f	Irreg.	40	4	-8.5 ± 1.1	0.76 <sup>+0.01</sup> <sub>-0.01</sub>	0.72 <sup>+0.01</sup> <sub>-0.01</sub>
NGC 2392	O6f	Const.	47	6	-5.5 ± 1.5	0.74 <sup>+0.02</sup> <sub>-0.02</sub>	0.70 <sup>+0.01</sup> <sub>-0.02</sub>
NGC 6891	O3f	Irreg.	50	5	-1.3 ± 1.3	—	—
NGC 6826	O4f	"	50	4	-0.2 ± 4.5	—	—
IC 3568	O5f	"	50	3	-0.3 ± 1.8	—	—
NGC 1535	O3	Irreg?	70	3	-0.6 ± 1.3	—	—
NGC 1360	sdO	Const?	80	7	-1.1 ± 1.5	—	—
NGC 7009	cont.	—	82	6	-2.1 ± 2.2	—	—
NGC 4361	sdO	—	82	3	+2.1 ± 1.1	—	—
NGC 7293	wD	"	90	8	-1.5 ± 1.1	—	—
NGC 6853	wD	"	>100	2	-0.6 ± 2.5	—	—
NGC 246	C3/OVI	Const.	>130	4	-3.5 ± 3.8	—	—
K1-16	PG 1159	Puls.	>150	10	+4.9 ± 1.9	—	—