

SELEZIONE N. 2020N23 – COLLOQUIO

ELENCO QUESITI N. 1

1. Il candidato descriva e giustifichi in dettaglio le operazioni di preparazione a una notte osservativa con lo spettrografo Boller & Chivens al telescopio Galileo dell'Osservatorio Astrofisico di Asiago.
2. Il candidato spieghi nel modo più semplice possibile il concetto di supernova e l'interesse della comunità astronomica su questi tipi di sorgenti immaginando di avere di fronte un pubblico non specializzato.
3. Il candidato spieghi cosa significa formattare un testo in Word e come si procede.

From Stellar Spectral Classification (Gray & Corbally, 2008)

Mrs. Williamina Fleming was assigned to examine the first survey's spectra, from which came both a classification and an estimate of magnitude for the 10,351 stars in the Draper Memorial Catalogue of 1890. For its classification scheme Pickering and Fleming subdivided the four Secchi types so that thirteen "letter" types resulted, and to these were added O for Wolf-Rayet (WR) spectra with bright lines, P for planetary nebula spectra, and Q for spectra remaining unclassified. So these Draper Memorial types introduced the letters with which we are familiar today. Most of the letters persisted; the O and B types were later put at the head; some were dropped, others changed, such as the C stars with double lines probably due to an instrumental fault; and as always, there was plenty of scope to refine the types by further subdivision. However this was a most significant start, again helped by a much increased database of spectra.

chp S. Gini
Giovanni Saccoccato

SELEZIONE N. 2020N23 – COLLOQUIO

ELENCO QUESITI N. 2

1. Il candidato descriva e giustifichi in dettaglio le operazioni di preparazione a una notte osservativa con lo strumento AFOSC in modalità fotometrica al telescopio Copernico dell'Osservatorio Astronomico di Padova.
2. Il candidato immagina di trovarsi davanti a un gruppo di studenti e di insegnanti e cerchi di spiegare in modo chiaro ed efficace il concetto di spettro stellare e l'uso che ne fa l'astronomo per ottenere parametri fisici di un oggetto in cielo.
3. Il candidato scelga un software per creare una locandina per un evento astronomico rivolto al pubblico e descriva le operazioni che eseguirebbe per realizzarla.

From Stellar Spectral Classification (Gray & Corbally, 2008)

The brighter stars were assigned to Miss Antonia Maury. To classify these more detailed spectra Maury reverted to Roman numerals for her 22 groups, I to XXII, the last being the WR stars. She was the first to place the Orion or B stars ahead of those with strongest hydrogen, the A stars. While she had in mind an evolutionary sequence in doing this, it was not explicitly a temperature sequence.

Another innovation was that Maury's groups were further divided according to the appearance of the lines in their spectra. So the addition of lowercase letters would refer to whether the lines were average width (a), hazy (b), or sharp (c). The hazy no doubt included rapid rotators and unresolved double-lined binaries. The c stars were comparatively few in number but were the indication of a "collateral division" among stars, which we now know to be luminosity. Not everyone appreciated such details and divisions, which amounted to some 74 types; the supporters of Vogel's system back in Europe were particularly critical of all these complications in spectral classification.

JP S. Grei
Gile Papi
Seccomato

SELEZIONE N. 2020N23 – COLLOQUIO

ELENCO QUESITI N. 3

1. Il candidato descriva e giustifichi in dettaglio le operazioni di preparazione a una notte osservativa con lo strumento AFOSC in modalità spettroscopica al telescopio Copernico dell'Osservatorio Astronomico di Padova.
2. Il candidato descriva l'evoluzione di una stella come il Sole in modo da essere compreso anche da studenti delle scuole medie inferiori.
3. Il candidato spieghi come sceglierebbe, preparerebbe e inserirebbe una figura per fare da sfondo a una locandina per un evento astronomico rivolto al pubblico.

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From Stellar Spectral Classification (Gray & Corbally, 2008)

Miss Annie Jump Cannon entered the Harvard scene to tackle the classification of the southern bright stars. Her 1901 classification scheme reverted to the letter types of Fleming, but updated for the Orion lines in the B stars and the Pickering series lines in the O stars. The letters were in the now familiar MK order OBAFGKM, so in this she followed Maury but put the WR stars firmly at the head. To cope with better precision available in the spectra, rather than adding letters along the lines of Maury adding Roman numerals, she was the first to subdivide the letters into decimal types. The notation for these decimal types settled into the now familiar A0, A2, etc. Among the stars not fitting into this scheme Cannon commented on those with peculiar silicon (also noted by Maury) or strontium, and particularly the metallic-line A stars, now called the Am stars.

clp S. Are.

Gilep Scarnato

SELEZIONE N. 2020N23 – COLLOQUIO

ELENCO QUESITI N. 4

1. Il candidato descriva e giustifichi le operazioni di preparazione di una notte osservativa e le modalità di osservazione con il telescopio Schmidt dell'Osservatorio Astronomico di Padova.
2. Il candidato descriva il concetto di buco nero centrale nelle galassie (inclusa la Via Lattea) e come gli astronomi lo studiano, immaginando di avere di fronte un pubblico generico di non esperti.
3. Il candidato descriva un software di sua conoscenza utile a creare un poster divulgativo ad alta risoluzione ed il suo utilizzo.

From An Introduction to Astronomical Photometry Using CCDs (Romanishin, 2006)

The largest refractors, built in the late 19th and early 20th century, include the Lick 36 inch and Yerkes 40 inch. Larger refractors than these have never been built, due to a number of factors. First, since the light must pass through the lens, it must be supported only along the edge of the glass. A large lens can flex as the angle between the lens and the pull of gravity changes, distorting the figure of the lens. Refractors suffer from chromatic aberration, meaning that light of different wavelengths come to slightly different focus. Chromatic aberration can be greatly mitigated by using 2 or more elements, or separate pieces of different types of glass. By proper choice of glasses with different index of refraction vs. wavelength curves, the chromatic aberration of one element can help cancel that of another element. However, using 2 or more elements has disadvantages such as increased cost and reflection light losses at each airglass interface.

Alf S. G. 2001
G. S. G. 2001
S. G. 2001

SELEZIONE N. 2020N23 – COLLOQUIO

ELENCO QUESITI N. 5

1. Il candidato descriva e giustifichi la diversa modalità di osservazione fra lo spettrografo Boller & Chivens del telescopio Galileo dell'Osservatorio Astrofisico di Asiago e lo strumento AFOSC al telescopio Copernico dell'Osservatorio Astronomico di Padova, stazione di Cima Ekar (Asiago).
2. Il candidato descriva i moti apparenti del Sole, della Luna e delle stelle immaginando di parlare di fronte a un pubblico generico.
3. Il candidato scelga un software di sua conoscenza per creare slide per una presentazione al pubblico e ne descriva le caratteristiche principali.

From Astronomical Spectroscopy (Tennyson, 2005)

In 1814, Joseph von Fraunhofer (1787–1826) used one of the high quality prisms he had manufactured to diffract a beam of sunlight, taken from a slit in his shutters, onto a whitewashed wall. Besides the characteristic colours of the rainbow, which had been observed in this fashion since Newton, he saw many dark lines. He meticulously catalogued the exact wavelength of each dark line and labelled the strongest of them with letters. Many of these labels, such as the sodium D lines are still used today. [...] The first real step in understanding Fraunhofer's observations came in the middle of the 19th century with the experiments of Gustav Kirchhoff (1824–1887) and Robert Bunsen (1811–1899). These scientists studied the colour of the light emitted when metals were burnt in flames. They found that in certain cases the wavelength of the emitted light gave an exact match with the Fraunhofer lines. The sodium D lines, which give sodium street lights their characteristic orange colour, were one such example. These experiments demonstrated that the Fraunhofer lines were a direct consequence of the atomic composition of the Sun.

GP S. Gini
Gini / S. Gini
S. Gini