## Origin of the Elements

	1 H Hydrogen		r-proce Inspire (see	ess to s-ped by prev http://b	mber give process ra- vious vers log.sdss.c	tios are fi ions from rg/2017/	rom Simr Jennifer 01/09/o	nerer et a Johnson	al. (2004) , Inese Iv	) ans, and	Anna Fre	ebel	(Lodders	2003).				2 He Helium
	and http://www.cosmic-origins.org/). This version by Andrew W. Steiner, awsteiner@utk.edu, python code (GPLv3) at https://github.com/awsteiner/nstar-plot/periodic_table.py													6 Carbon	<sup>7</sup> N	<sup>8</sup> O	<sup>9</sup> F	Ne
	Lithium 3.35±0.06	1.48±0.08	There are significant uncertainties in some values that are not shown here.  The origin of some elements is strongly isotope-dependent.												Nitrogen 7.90±0.11	Oxygen 8.76±0.05	Fluorine 4.53±0.06	Neon 7.95±0.10
	Na	Mg											AI	Si	<sup>15</sup> P	<sup>16</sup> S	CI	Ar
	Sodium 6.37±0.03	Magnesium 7.62±0.02											Aluminum 6.54±0.02		Phosphorus 5.54±0.04	Sulfur 7.26±0.04	Chlorine 5.33±0.06	Argon 6.62±0.08
I	19 <b>K</b>	Ca	<sup>21</sup> Sc	<sup>22</sup> <b>Ti</b>	<sup>23</sup> V	Cr	Mn	Fe Fe	<sup>27</sup> Co	<sup>28</sup> Ni	Cu	$Z_n$	Ga	Ge	33 <b>As</b>	Se	Br	Kr
	Potassium 5.18±0.05		Scandium 3.15±0.04	Titanium 5.00±0.03	Vanadium		Manganese 5.58±0.03	Iron 7.54±0.03	Cobalt 4.98±0.03	Nickel 6.29±0.03	Copper 4.34±0.06	Zinc 4.70±0.04	Gallium	Germanium 3.70±0.05	Arsenic	Selenium 3.43±0.04	Bromine 2.67±0.09	Krypton 3.36±0.08
	Rb	Sr	39 <b>Y</b>	Zr	Nb	<sup>42</sup> Mo	<sup>43</sup> Tc	<sup>44</sup> Ru	Rh	Pd	Ag	<sup>48</sup> Cd	<sup>49</sup> In	Sn	Sb	<sup>52</sup> Te	53 <b> </b>	Xe Xe
- 1	Rubidium 2.43±0.06	Strontium 2.99±0.04	Yttrium 2.28±0.03	Zirconium 2.67±0.03	Niobium 1.49±0.03	Molybdenum 2.03±0.04	Technetium		Rhodium 1.18±0.03	Palladium 1.77±0.03		Cadmium 1.81±0.03	Indium 0.87±0.03		Antimony 1.14±0.07	Tellurium 2.30±0.04	lodine 1.61±0.12	Xenon 2.35±0.02
	55 Cs Cesium	56 Ba Barium 2.25±0.03		72 <b>Hf</b> Hafnium 0.84±0.04	73 Ta Tantalum	74 W Tungsten		76 Os Osmium	77   <b>r</b>   Iridium	78 Pt Platinum 1.75±0.03	79 Au <sub>Gold</sub>	Hg Mercury	81 TI Thallium	Pb Lead	Bi Bismuth	Po Polonium	At Astatine	Rn Radon
	Francium	Ra Radium		Rutherfordium	Db Dubnium	Seaborgium	Bohrium	Hassium	Meitnerium	DS Darmstadtium	Roentgenium	Cn	Nihonium	114 Fl Flerovium	Moscovium	116 LV Livermorium	Tennessine	Oganesson

	La	Ce Ce	Pr	Nd	Pm	Sm	Eu	Gd Gd	Tb	Dy	<sup>67</sup> Ho	Er	Tm	Yb	Lu
	Lanthanum	Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
[	$1.25 \pm 0.06$	$1.68 \pm 0.02$	$0.85 \pm 0.03$	$1.54 \pm 0.03$		$1.02 \pm 0.04$	$0.60 \pm 0.04$	$1.13\pm0.02$	$0.38 \pm 0.03$	$1.21 \pm 0.04$	$0.56 \pm 0.02$	1.02±0.03	$0.18 \pm 0.06$	$1.01 \pm 0.03$	$0.16 \pm 0.06$
	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
	Actinium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium
		$0.16 \pm 0.04$		-0.42±0.04											