

Coexistence of superconductivity and ferromagnetism in $\text{Sr}_{0.5}\text{Ce}_{0.5}\text{FBiS}_{2-x}\text{Se}_x$ ($x = 0.5$ and 1.0), the non-U material with $T_c < T_{\text{FM}}$

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Figure S1. Compositional analysis of $\text{Sr}_{0.5}\text{Ce}_{0.5}\text{FBiS}_{2-x}\text{Se}_x$ ($x = 0.5, 1.0$) samples by SEM–EDAX. The typical spectra show the presence of all the constituent elements in the selected region (inset). Many such regions were selected and all the monitored regions had acceptable S and Se contents, thus eliminating the possibility of any phase separation.

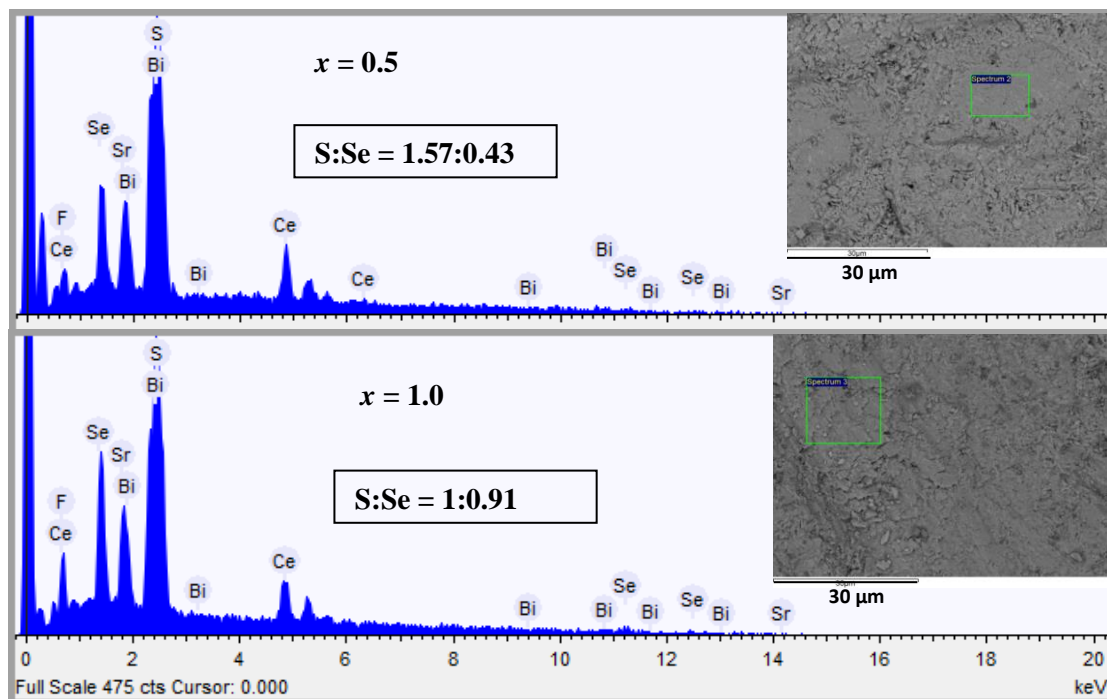


Table S1. Elemental ratio taken at several regions for Sr_{0.5}Ce_{0.5}FBiS_{1.5}Se_{0.5}

Experiment #	1	2	3	4	5	6	Average
Fluorine	13.11	20.32	18.06	22.72	21.34	24.45	20.00
Sulfur	33.16	35.01	28.47	29.06	29.59	32.16	31.24
Selenium	10.01	8.77	9.71	7.25	8.62	8.19	8.76
Strontium	9.45	9.01	7.07	10.74	10.15	10.06	9.41
Cerium	6.12	9.85	7.51	10.51	12.78	11.09	9.72
Bismuth	28.13	16.99	29.18	19.53	17.42	14.05	20.88

Average composition: Sr_{0.48}Ce_{0.49}FBi_{1.05}S_{1.57}Se_{0.43}

Table S2. Elemental ratio taken at several regions for Sr_{0.5}Ce_{0.5}FBiS_{1.5}Se_{0.5}

Experiment #	1	2	3	4	5	6	Average
Fluorine	13.62	21.32	17.06	25.72	19.34	23.05	20.02
Sulfur	22.16	23.01	19.47	14.06	20.59	21.16	20.07
Selenium	15.21	19.71	14.71	22.25	19.62	18.09	18.26
Strontium	8.45	10.11	10.07	8.74	11.15	9.06	9.59
Cerium	7.22	8.85	8.51	9.51	11.08	9.49	9.71
Bismuth	33.33	16.99	30.18	19.53	18.42	19.15	22.93

Average composition: Sr_{0.48}Ce_{0.46}F_{1.01}Bi_{1.14}S_{1.00}Se_{0.91}

Figure S2. Temperature dependent magnetic susceptibility and its derivative indicating the T_c and T_{FM} for $Sr_{0.5}Ce_{0.5}FBiS_{2-x}Se_x$ (a) $x = 0.5$ and (b) $x = 0.1$.

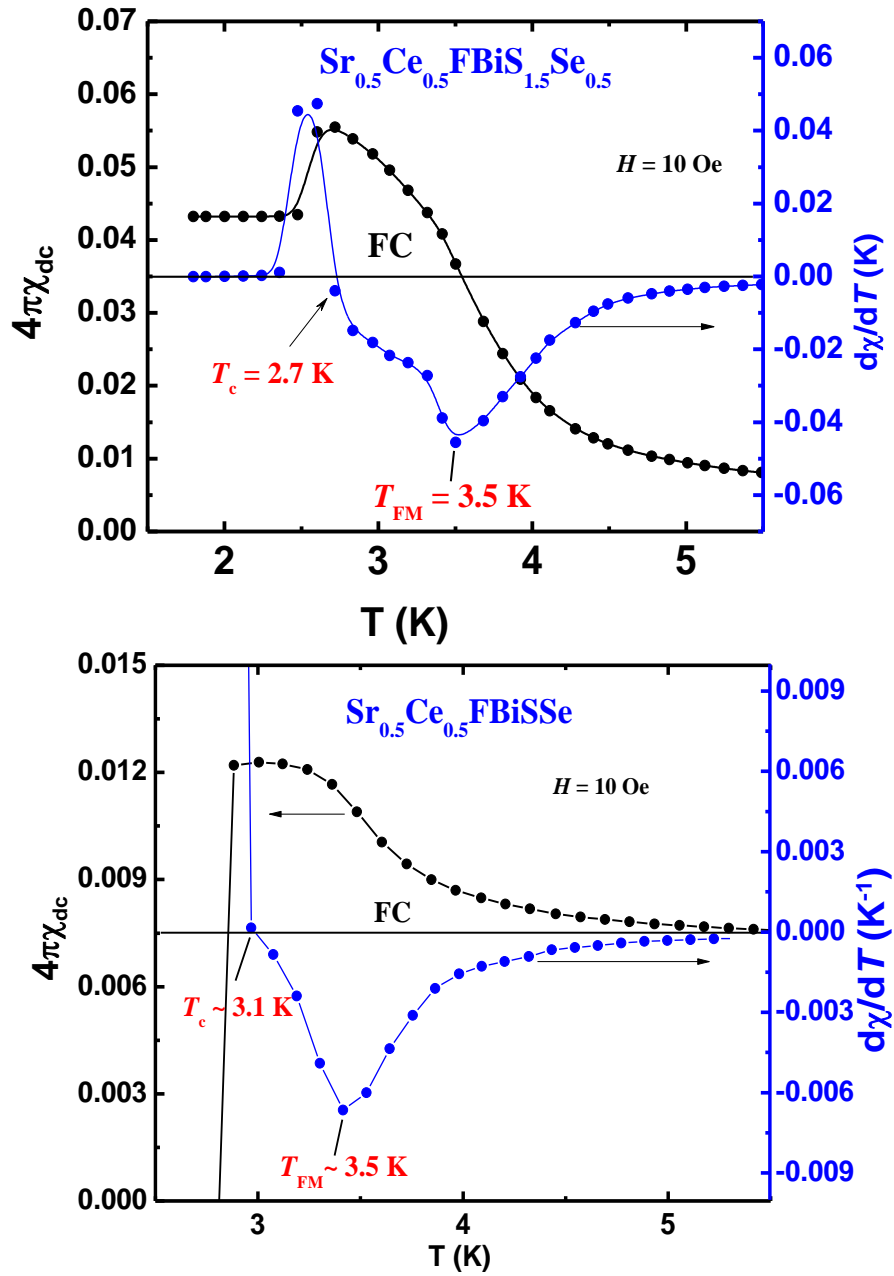


Figure S3. Variable temperature paramagnetic susceptibility (black) and its inverse (green) for $\text{Sr}_{0.5}\text{Ce}_{0.5}\text{FBiS}_{1.5}\text{Se}_{0.5}$ (a) and $\text{Sr}_{0.5}\text{Ce}_{0.5}\text{FBiS}_{1.0}\text{Se}_{1.0}$ (b). Red line is the Curie–Weiss fit.

