Number of Ionized Dopants vs doping density for Si at T = 300K 1.2  $N_A - /N_A Si$  $N_T^-/N_T$  Si 1.0 8.0 0.6 0.4 Si Parameter:  $E_a = 1.12 \text{ eV}$  $m_{n}^{*}=1.18~m_{e}$ 0.2  $m_p^* = 0.81 m_e$ 0.0

10<sup>20</sup>

doping density / m<sup>-3</sup>

10<sup>22</sup>

 $10^{24}$ 

10<sup>16</sup>

10<sup>18</sup>