Errata
Geometric Invariant Theory
over the real and complex numbers

p. 63 line -8 replace is non-trivial with $\mathcal{O}(V)^G \neq \mathbb{C}1$.
p. 88 line 9 replace $\mathfrak{a}$ with V.
p. 97 line 6 delete the $\frac{1}{2}$ in Lemma 3.79 2.
p. 98 line 9 the right hand side of the equation should say

$$|W| \sum_{k=1}^{n} \left(\frac{1}{d_k} + \frac{d_k - 1}{2d_k}(1-q) + o(1-q) \right) \prod_{j \neq k} \frac{1-q}{1-q^{d_j}}$$

p. 104-105 Replace Proposition 3.86 with
Lemma 3.86. (H, V) be a Vinberg pair with Cartan subspace $\mathfrak{a}$. Then

$$\dim H + \dim \mathfrak{a} \geq \dim V.$$

If the pair is regular then $\mathfrak{n} = 0$ and the inequality is equality.
Proof. We have seen that $H(\mathfrak{a} + \mathfrak{n})$ has non-empty Zariski interior in V. Also if

$$U = [C_G(\mathfrak{a}), C_G(\mathfrak{a})], \mathfrak{u} = Lie(U), M = Ad_{\mathfrak{u}}(U)^{\theta}_{|\mathfrak{u} \cap V}$$

then

$$(M, \mathfrak{u} \cap V)$$

is a Vinberg pair. We note that $\mathfrak{u} \cap V = \mathfrak{n}$. Thus every element is nilpotent. This implies that $\mathfrak{n}$ consists of a finite number of nilpotent orbits. Hence one of them, Mx, must be open in $\mathfrak{n}$. This implies that

$$\dim V = \dim H - \dim C_G(\mathfrak{a})^{\theta}_x + \dim \mathfrak{a}.$$

If the pair is regular then have $C_G(\mathfrak{a})$ has a maximal torus in its centralizer. Since it is reductive and there can't be simi-simple elements in $Lie(C_G(\mathfrak{a}), C_G(\mathfrak{a}))$. We see that $Lie(C_G(\mathfrak{a}), C_G(\mathfrak{a})) = 0$. Thus $C_G(\mathfrak{a})^o = T_{\mathfrak{a}}$. Hence $\dim C_G(\mathfrak{a})^{\theta} = 0$. ∎

p. 111 line 13 replace $e^{\frac{2\pi i}{3} ad_2}$ with $e^{\frac{2\pi i}{3} adH_2}$
at the end of theorem 3.100 the 8 should be replaced with 12.
p. 117 line -3 the sum should be over k
line -1 delete the sum in the left side of the equation and the subscript of h in the determinant on the right hand side shoul be a j.That is the last line should read

$$\det \frac{\partial g_k}{\partial x_j} \det \frac{\partial h_j}{\partial t_k}(x_i, g_1, ..., g_n) = (-1)^n \prod_{i=1}^{n} \frac{\partial h_i}{\partial t_0}(x_i, g_1, ..., g_n).$$