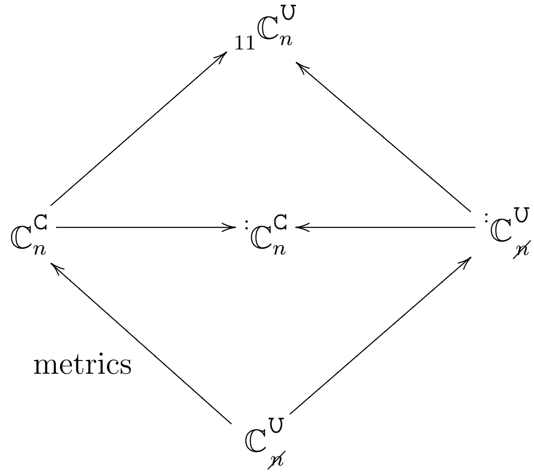
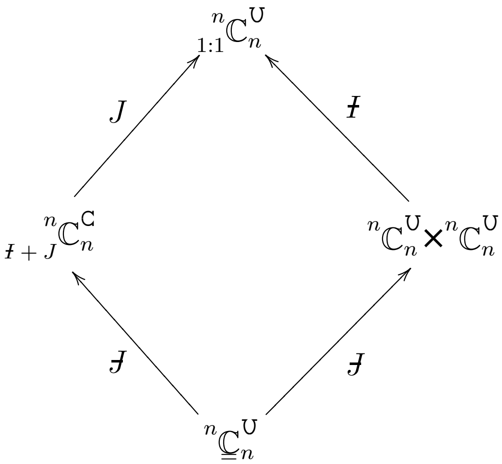
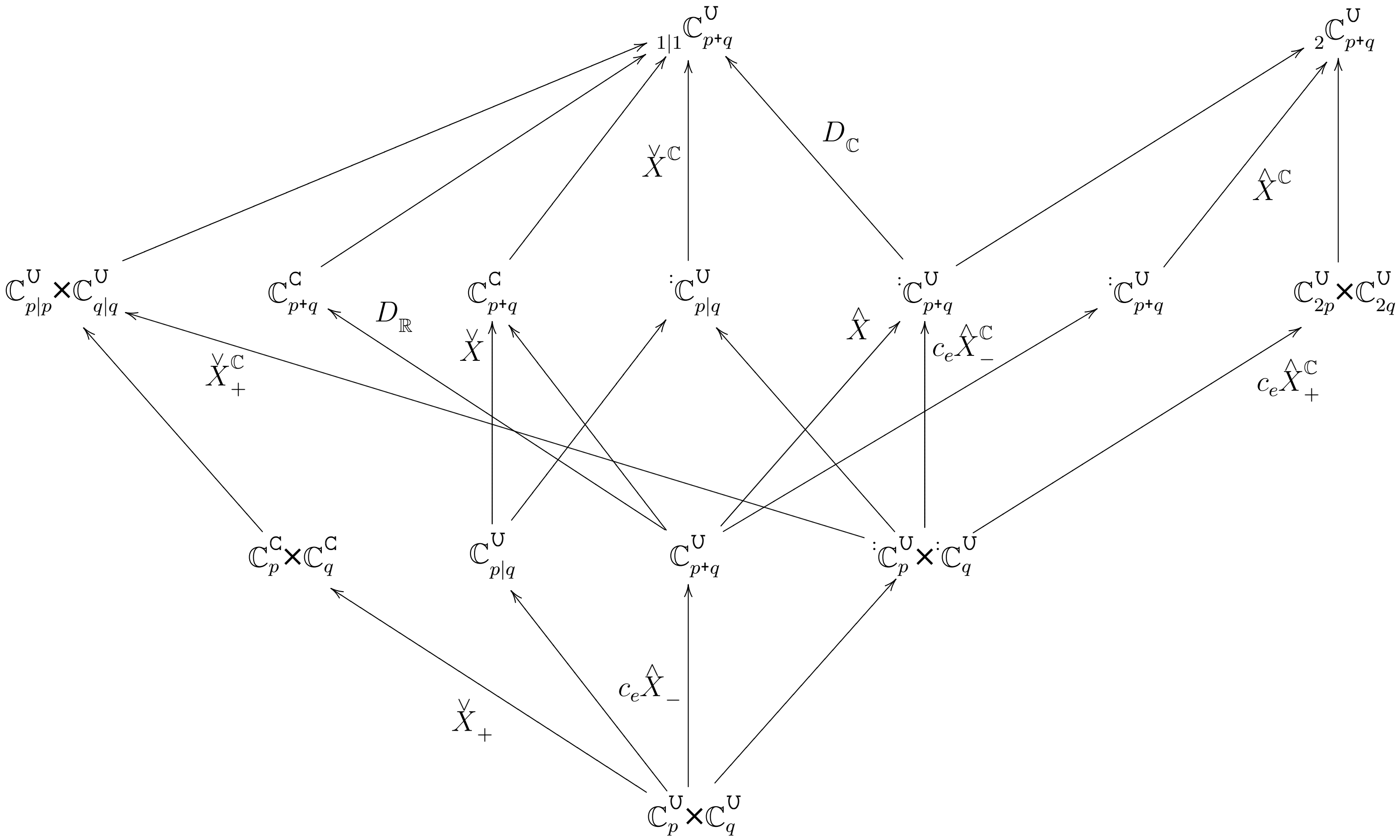
$$X = \mathbb{C}_n^{\text{aher}}$$

$$X_+ = \mathbb{C}_p^{\text{aher}} \times \mathbb{C}_q^{\text{aher}}$$







$${}^{n}_{1:1}\mathbb{C}^{\mathsf{U}}_{n} \ni \begin{array}{c|c} a & b \\ \hline \overset{*}{b} & d \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ d = -\overset{*}{d} \end{cases}$$

$${}^{n}_{\times}\mathbb{C}^{\mathsf{U}}_{n} \ni \begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ d = -\overset{*}{d} \end{cases}$$

$$\begin{array}{c|c} a & b \\ \hline \overset{*}{b} & d \end{array} = \not{I} \begin{array}{c|c} a & b \\ \hline \overset{*}{b} & d \end{array} \not{I} = \begin{array}{c|c} a & -b \\ \hline -\overset{*}{b} & d \end{array} \Leftrightarrow b = 0$$

$$\begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} \; {}^{n}_{*}\mathbb{C}^{\mathsf{C}}_{n} \begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} \ni \begin{array}{c|c} a & b \\ \hline b & a \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ b = \overset{*}{b} \end{cases}$$

$$\begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} \begin{array}{c|c} a & 0 \\ \hline 0 & -\overset{*}{a} \end{array} \begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} = \begin{array}{c|c} a - \overset{*}{a} & a + \overset{*}{a} \\ \hline a + \overset{*}{a} & a - \overset{*}{a} \end{array}$$

$$\begin{array}{c|c} a & b \\ \hline \overset{*}{b} & d \end{array} = J \begin{array}{c|c} a & b \\ \hline \overset{*}{b} & d \end{array} J = \begin{array}{c|c} d & \overset{*}{b} \\ \hline b & a \end{array} \Leftrightarrow \begin{cases} a = d \\ b = \overset{*}{b} \end{cases}$$

$$\begin{array}{c|c} a & b \\ \hline b & a \end{array} = \not{J}\begin{array}{c|c} a & b \\ \hline b & a \end{array}\overset{-1}{\not{J}} = \begin{array}{c|c} a & -b \\ \hline -b & a \end{array} \Leftrightarrow b = 0$$

$$\begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} = \not{J}\begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array}\not{J} = \begin{array}{c|c} d & 0 \\ \hline 0 & a \end{array} \Leftrightarrow a = d$$

$${}^{n}_{=}\mathbb{C}^{\mathsf{U}}_{n} \ni \begin{array}{c|c} a & 0 \\ \hline 0 & a \end{array} : \quad a = -\overset{*}{a}$$

$${}^{n}_{1:1}\mathbb{C}^{\mathsf{U}}_{n} = \frac{g \in {}^{n}_{1:1}\mathbb{C}^{\mathsf{C}}_{n}}{\overset{*}{g}\not{I}g = \not{I}: \quad \not{I}\overset{*}{g}\not{I} = \overset{-1}{g}}$$

$${}^{n}_{\not{I}+J}\mathbb{C}^{\mathsf{C}}_{n} = \begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array}\, {}^{n}_{t}\mathbb{C}^{\mathsf{C}}_{n} \begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} = \begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array}\begin{array}{c|c} a & 0 \\ \hline 0 & \overset{*}{a}^{-1} \end{array}\begin{array}{c|c} 1 & 1 \\ \hline 1 & -1 \end{array} = \begin{array}{c|c} a + \overset{*}{a}^{-1} & a - \overset{*}{a}^{-1} \\ \hline a - \overset{*}{a}^{-1} & a + \overset{*}{a}^{-1} \end{array} = \frac{g \in {}^{n}_{1:1}\mathbb{C}^{\mathsf{U}}_{n}}{gJ = Jg}$$

$$\not{J}\begin{array}{c|c} a + \overset{*}{a}^{-1} & a - \overset{*}{a}^{-1} \\ \hline a - \overset{*}{a}^{-1} & a + \overset{*}{a}^{-1} \end{array}\overset{-1}{\not{J}} = \begin{array}{c|c} a + \overset{*}{a}^{-1} & \overset{*}{a}^{-1} - a \\ \hline \overset{*}{a}^{-1} - a & a + \overset{*}{a}^{-1} \end{array} = \begin{array}{c|c} a + \overset{*}{a}^{-1} & \overset{*}{a}^{-1} - a \\ \hline \overset{*}{a}^{-1} - a & a + \overset{*}{a}^{-1} \end{array} \Leftrightarrow a = \overset{*}{a}^{-1}$$

$$\begin{array}{c|c} 0 & b \\ \hline -b & 0 \end{array} \in \begin{array}{c|c} 0 & {}^{n}\mathbb{R}^{\mho}_{n} \\ \hline -\imath & 0 \end{array} \longrightarrow \frac{{}^{n}_{t}\mathbb{R}^{\mathsf{C}}_{n}}{{}^{n}_{=}\mathbb{R}^{\mathsf{U}}_{n}} \ni \begin{array}{c|c} \overbrace{1+b}^{-1}\overbrace{1-b} & 0 \\ \hline 0 & \underbrace{1-b}_{-1}\underbrace{1+b} \end{array}$$

$$\begin{array}{c|c} a & b \\ \hline c & -\overset{*}{a} \end{array} \in {}^{n}_{2}\mathbb{C}^{\mho}_{n}J \xrightarrow{\overbrace{\not{J}-z}^{-1}\underbrace{\not{J}+z}} {}^{n}_{1:1}\mathbb{C}^{\mathsf{U}}_{n}$$

$$\begin{array}{c|c} a & 0 \\ \hline 0 & -a \end{array} \in \begin{array}{c|c} {}^{n}\mathbb{R}^{\mho}_{n} & 0 \\ \hline 0 & \end{array} \longrightarrow \frac{{}^{n}_{\mathbb{R}}\mathbb{C}^{\mathsf{U}}_{n}}{{}^{n}_{=}\mathbb{R}^{\mathsf{U}}_{n}} \ni \begin{array}{c|c} \overbrace{1-a^2}\overbrace{1+a^2}^{-1} & -2a\overbrace{1+a^2}^{-1} \\ \hline 2a\underbrace{1+a^2}_{-1} & \underbrace{1-a^2}\underbrace{1+a^2}_{-1} \end{array}$$

$$g = \overbrace{\not{J}-z}^{-1}\underbrace{\not{J}+z}$$

$$g^{-1} = \overbrace{\not{J}+z}^{-1}\underbrace{\not{J}-z}$$

$$\not{I}\,\overset{*}{g}\,\not{I} = \not{I}\underbrace{\overset{*}{\not{J}}+\overset{*}{z}}\overbrace{\overset{*}{\not{J}}-\overset{*}{z}}^{-1}\not{I} = \not{I}\underbrace{\not{J}-\overset{*}{z}}\overbrace{\not{J}+\overset{*}{z}}^{-1}\not{I} = \underbrace{\not{I}\not{J}\not{I} - \not{I}\overset{*}{z}\not{I}}\overbrace{\not{I}\not{J}\not{I} + \not{I}\overset{*}{z}\not{I}}^{-1} = \underbrace{\not{J}+\not{I}\overset{*}{z}\not{I}}\overbrace{\not{J}-\not{I}\overset{*}{z}\not{I}}^{-1}$$

$$\overbrace{\not{J}+z}^{-1}\underbrace{\not{J}-z} = \underbrace{\not{J}+\not{I}\overset{*}{z}\not{I}}\overbrace{\not{J}-\not{I}\overset{*}{z}\not{I}}^{-1} \Leftrightarrow \underbrace{\not{J}-z}\underbrace{\not{J}-\not{I}\overset{*}{z}\not{I}} = \underbrace{\not{J}+z}\underbrace{\not{J}+\not{I}\overset{*}{z}\not{I}} \Leftrightarrow J\overset{*}{z}J = -z$$

$$z = \begin{array}{c|c} a & b \\ \hline c & -\overset{*}{a} \end{array} \begin{cases} \overset{*}{b} = -b \\ \overset{*}{c} = -c \end{cases} \Leftrightarrow zJ \in {}^{n}_{2}\mathbb{C}^{\mho}_{n}$$

$$\not{J} \begin{array}{c|c} a & b \\ \hline c & -\overset{*}{a} \end{array} \overset{-1}{\not{J}} = -\begin{array}{c|c} a & b \\ \hline c & -\overset{*}{a} \end{array} \Leftrightarrow \begin{cases} a = \overset{*}{a} \\ b = c \end{cases} \Leftrightarrow z = \begin{array}{c|c} a & b \\ \hline b & -a \end{array}$$

$${}^{p|q}\mathbb{C}^{\pm\imath\mho}_{p|q} = {}^{p|q}\mathbb{C}^{\mho}_{p|q} \neg \begin{cases} {}^{p|q}\mathbb{C}^{\mho}_{p|q} \\ \times \\ {}^{p+q}\mathbb{C}^{\complement}_{p+q} \end{cases}$$

$$\beta = \begin{array}{c|c} 0 & 1 \\ \hline 1 & 0 \end{array}$$

$$\begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} \beta = \beta \begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} \Leftrightarrow a = d$$

$${}^{n}\mathbb{K}^{\mho}_{n} = \frac{\begin{array}{c|c} u & v \\ \hline \overset{*}{v} & w \end{array}}{u = \overset{*}{u} : w = \overset{*}{w}}$$

$$\begin{array}{c|c} 0 & {}^{n}\mathbb{C}_n^{\mho} \\ \hline -* & 0 \end{array} \ni z \Longrightarrow 1+2\beta\, z^{\beta} \in \frac{\begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} \in {}^{p|q}_{\times}\mathbb{C}^{\mathsf{U}}_{p|q}}{d = \overset{-1}{a}} = {}^{p|q}\mathbb{C}^{\mathsf{U}}_{p|q} \neg {}^{p|q}_{\times}\mathbb{C}^{\mathsf{U}}_{p|q}$$

$$\begin{array}{c|c} 0 & {}^{n}\mathbb{C}_n^{\mho} \\ \hline * & 0 \end{array} \ni z \Longrightarrow 1+2\beta\, z^{\beta} \in \frac{\begin{array}{c|c} a & 0 \\ \hline 0 & \overset{*}{a}^{-1} \end{array} \in {}^{p+q}\mathbb{C}^{\mathsf{C}}_{p+q}}{a = \overset{*}{a}} = {}^{p|q}\mathbb{C}^{\mathsf{U}}_{p|q} \neg {}^{p+q}\mathbb{C}^{\mathsf{C}}_{p+q}$$

$$z = \begin{array}{c|c} 0 & v \\ \hline \overset{*}{v} & 0 \end{array}$$

$$\begin{array}{c|c} \overbrace{1+v}^{-1}\underbrace{1-v} & 0 \\ \hline 0 & \overbrace{1-v}^{-1}\underbrace{1+v} \end{array} \in {}^{p|q}_{\times}\mathbb{C}^{\mathsf{U}}_{p|q}$$

$$1+2\beta \overset{\beta}{\begin{array}{c|c} 0 & v \\ \hline -v & 0 \end{array}} = \overset{-1}{\begin{array}{c|c} 0 & 1-v \\ \hline 1+v & 0 \end{array}} \begin{array}{c|c} 0 & 1+v \\ \hline 1-v & 0 \end{array} = \begin{array}{c|c} 0 & \overbrace{1+v}^{-1} \\ \hline \overbrace{1-v}^{-1} & 0 \end{array} \begin{array}{c|c} 0 & 1+v \\ \hline 1-v & 0 \end{array} = \begin{array}{c|c} \overbrace{1+v}^{-1}\underbrace{1-v} & 0 \\ \hline 0 & \overbrace{1-v}^{-1}\underbrace{1+v} \end{array}$$

$$\overbrace{\overbrace{1-v}^{-1}\underbrace{1+v}}^{*} = \underbrace{1+\overset{*}{v}}\overbrace{1-\overset{*}{v}}^{-1} = \underbrace{1-v}\overbrace{1+v}^{-1}$$

$$1+2\beta \overset{\beta}{\begin{array}{c|c} 0 & v \\ \hline v & 0 \end{array}} = \overset{-1}{\begin{array}{c|c} 0 & 1-v \\ \hline 1-v & 0 \end{array}} \begin{array}{c|c} 0 & 1+v \\ \hline 1+v & 0 \end{array} = \begin{array}{c|c} 0 & \overbrace{1-v}^{-1} \\ \hline \overbrace{1-v}^{-1} & 0 \end{array} \begin{array}{c|c} 0 & 1+v \\ \hline 1+v & 0 \end{array} = \begin{array}{c|c} \overbrace{1-v}^{-1}\underbrace{1+v} & 0 \\ \hline 0 & \overbrace{1-v}^{-1}\underbrace{1+v} \end{array}$$

$$\beta_z \in {}^{p|q}\mathbb{C}^{\mathsf{U}}_{p|q} \neg {}^{p|q}_{\times}\mathbb{C}^{\mathsf{U}}_{p|q} \Leftrightarrow \overset{*}{v} = -v \Leftrightarrow v \in {}^{n}\mathbb{C}_n^{\mho}$$

$${}^{\;n}_{1:1}\mathbb{C}_n^{\mathsf{U}} \ni y = \begin{array}{c|c} a & b \\ \hline c & d \end{array} = \begin{array}{c|c} 1 & 0 \\ \hline 0 & -1 \end{array} \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & -1 \end{array} = \begin{array}{c|c} a & -b \\ \hline -c & d \end{array} \Leftrightarrow y = \begin{array}{c|c} a & 0 \\ \hline 0 & d \end{array} \in {}^{n}\mathbb{C}_n^{\mathsf{U}} \times {}^{n}\mathbb{C}_n^{\mathsf{U}}$$

$${}^{\;n}_{1:1}\mathbb{C}_n^{\mathsf{U}} \ni y = \begin{array}{c|c} a & b \\ \hline c & d \end{array} = \begin{array}{c|c} 0 & i \\ \hline -i & 0 \end{array} \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 0 & i \\ \hline -i & 0 \end{array} = \begin{array}{c|c} d & -c \\ \hline -b & a \end{array} \Leftrightarrow y = \begin{array}{c|c} a & b \\ \hline -b & a \end{array} \Leftrightarrow \begin{array}{c|c} 1 & i \\ \hline -i & -1 \end{array} y \begin{array}{c|c} 1 & i \\ \hline -i & -1 \end{array} = \begin{array}{c|c} a-ib & 0 \\ \hline 0 & a+ \end{array}$$