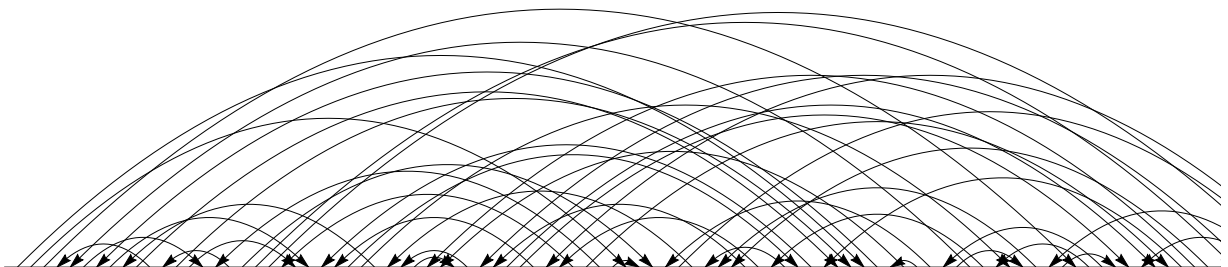


```
In[ ]:= SetDirectory["C:\\drorbn\\AcademicPensieve\\Talks\\KOS-211021"]
```

```
Out[ ]:= C:\drorbn\AcademicPensieve\Talks\KOS-211021
```

```
In[ ]:= RandomGaussDiagram[n_] := Module[{i, j},
  Graphics[ {
    Arrowheads[0.015],
    Arrow@Line[{{0, 0}, {2 n + 2, 0}}],
    Arrowheads[0.01],
    Table[
      {i, j} = a;
      Arrow@BezierCurve[{{i, 0}, { $\frac{i+j}{2}$ , Abs[ $\frac{i-j}{2}$ ]}, {j, 0}}],
      {a, Partition[PermutationList@RandomPermutation[2 n], 2]}
    ]
  ]
];
RandomGaussDiagram[50]
```

```
Out[ ]:=
```

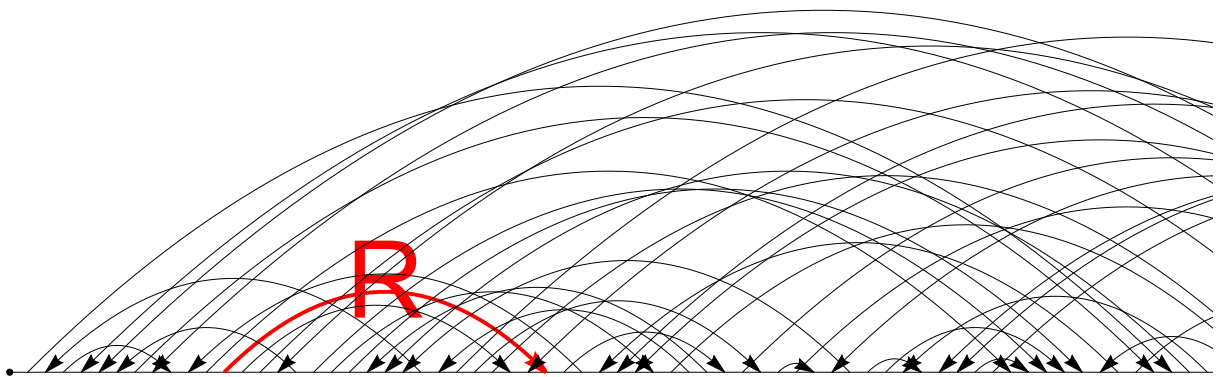


```

In[ ]:= RandomGaussDiagram[n_, as___] := Module[{i, j, a, is},
  is = Range[n];
  Graphics[{
    Arrowheads[0.015],
    Disk[{0, 0}, 0.2],
    Arrow@Line[{{0, 0}, {n + 2, 0}}],
    Arrowheads[0.01],
    Flatten@Table[
      {i, j} = List@@a[[2, 3]];
      is = Complement[is, {i, j}];
      {
        a[[1],
        Arrow@BezierCurve[{{i, 0}, { $\frac{i+j}{2}$ , Abs[ $\frac{i-j}{2}$ ]}, {j, 0}}],
        Text[Style[a[[4], 56], { $\frac{i+j}{2}$ , Abs[ $\frac{i-j}{3.5}$ ]}]
      },
      {a, {as}}
    ],
    Black,
    Table[
      {i, j} = a;
      Arrow@BezierCurve[{{i, 0}, { $\frac{i+j}{2}$ , Abs[ $\frac{i-j}{2}$ ]}, {j, 0}}],
      {a, Partition[is[[PermutationList@RandomPermutation@Length@is]], 2]}
    ]
  }];
RandomGaussDiagram[100, {{Thick, Red}, 12, 30, "R"]}

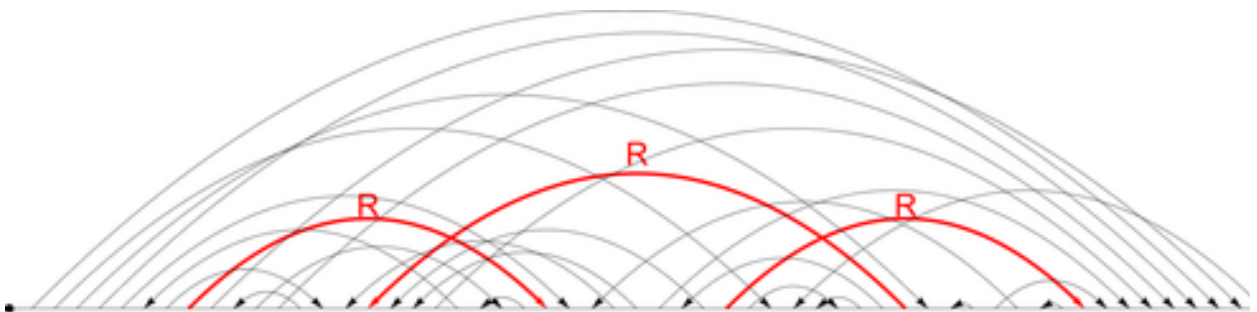
```

Out[]:=



```
In[ ]:= MakeImage["GD1",
  RandomGaussDiagram[56, {{Thickness[0.0025], Red}, 8, 24, "R"},
    {{Thickness[0.0025], Red}, 40, 16, "R"}, {{Thickness[0.0025], Red}, 32, 48, "R"}]
]
```

Out[]:=

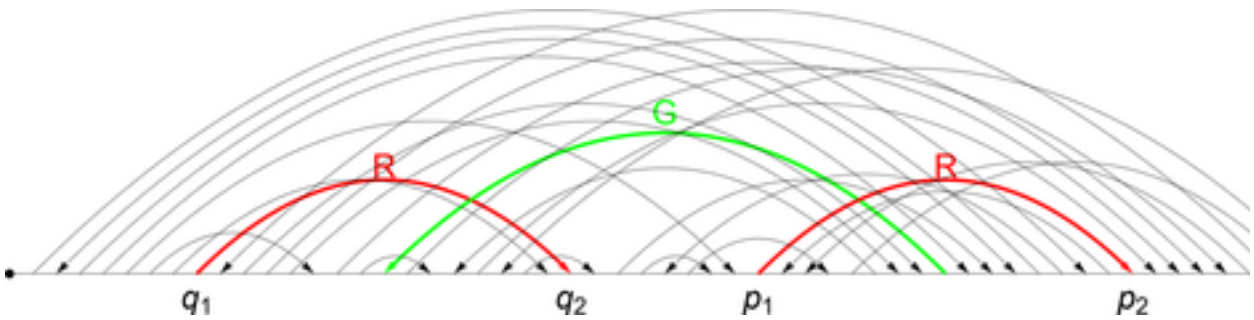


```

In[ ]:= MakeImage["GD2",
  Graphics[Join[
    First@RandomGaussDiagram[56, {{Thickness[0.0025], Red}, 8, 24, "R"},
      {{Thickness[0.0025], Green}, 40, 16, "G"}, {{Thickness[0.0025], Red}, 32, 48, "R"}],
    {
      Text[Style["q1", 56], {8, -1}],
      Text[Style["q2", 56], {24, -1}],
      Text[Style["p1", 56], {32, -1}],
      Text[Style["p2", 56], {48, -1}],
    }
  ]
]

```

Out[]:=

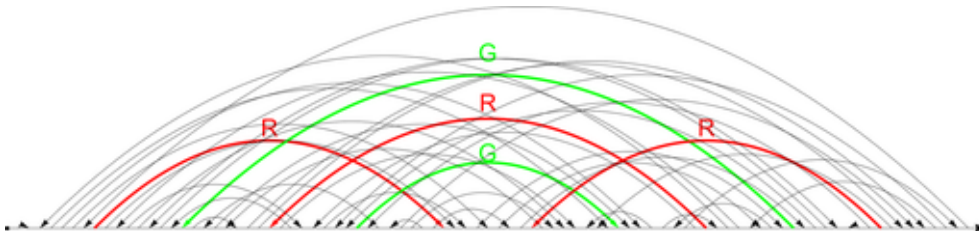


```

In[ ]:= MakeImage["GD3",
  RandomGaussDiagram[88, {{Thickness[0.0025], Red}, 8, 40, "R"},
    {{Thickness[0.0025], Green}, 72, 16, "G"}, {{Thickness[0.0025], Red}, 64, 24, "R"},
    {{Thickness[0.0025], Green}, 32, 56, "G"}, {{Thickness[0.0025], Red}, 80, 48, "R"}]
]

```

Out[]:=

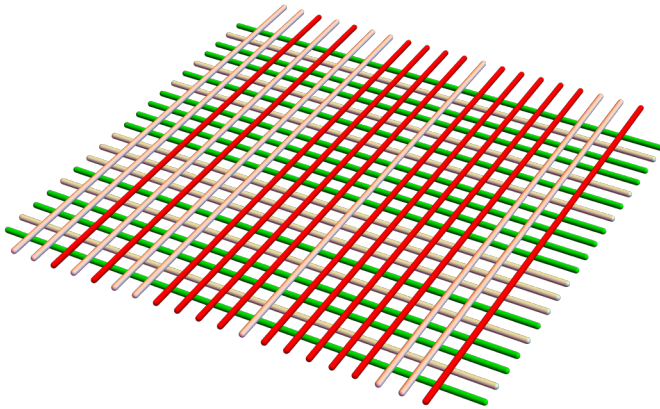


```

In[ ]:= Logs[n_, p_] := Graphics3D[{
  Table[{
    If[Random[] < p, Red, LightRed], Tube[Line[{{3 k - 1, -3, 1}, {3 k - 1, 3 n + 4, 1}}]]
  },
  {k, n}
],
  Table[{
    If[Random[] < p, Green, LightGreen],
    Tube[Line[{{-3, 3 k - 1, -1}, {3 n + 4, 3 k - 1, -1}}]]
  },
  {k, n}
]
}, Boxed → False];
Logs[20, 0.5]

```

Out[]:=

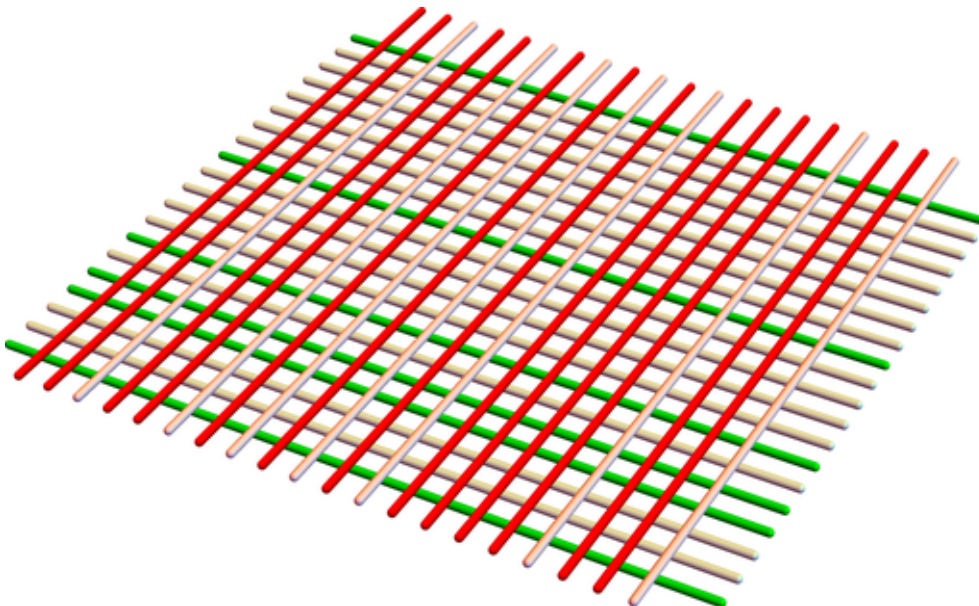


```

In[ ]:= MakeImage["Logs", Logs[20, 0.5]]

```

Out[]:=



```

In[ ]:= Spine[n_] := Graphics3D[{
  Table[{
    Red, Tube[Line[{{3 k - 1, -3, 1/2}, {3 k - 1, 3 n + 4, 1/2}}]],
    ParametricPlot3D[
      {3 k - 1 + Cos[θ], t, Sin[θ]},
      {t, -3, 3 n + 4}, {θ, 0, π},
      Mesh → False, PlotStyle → Directive[Blue, Opacity[0.2]]
    ][[1]]
  },
  {k, n}
],
  Table[{
    Green, Tube[Line[{{-3, 3 k - 1, -1/2}, {3 n + 4, 3 k - 1, -1/2}}]],
    ParametricPlot3D[
      {t, 3 k - 1 + Cos[θ], -Sin[θ]},
      {t, -3, 3 n + 4}, {θ, 0, π},
      Mesh → False, PlotStyle → Directive[Blue, Opacity[0.2]]
    ][[1]]
  },
  {k, n}
],
  Opacity[0.2], Blue,
  Polygon[{{-3, -3, 0}, {-3, 3 n + 4, 0}, {3 n + 4, 3 n + 4, 0}, {3 n + 4, -3, 0}}]
}, Boxed → False];
Spine[3]

```

Out[]:=

