

## Wave Propagation and Reflection I

```
In[45]:= Clear["Global`*"];
Off[General::spell1];
```

- Define a Gaussian wave packet propagating in the +x direction with  $v=1$  and which is reflected at  $x = 10$  (simulated using a virtual wave propagating to the left). The coefficient of the virtual wave ( $\text{cref}$ ) gives open-ended ( $=+1$ ) or closed-end ( $=-1$ ) reflection.

```
In[47]:= wave[x_, t_] = e-(x-v t)2 + cref e-(x-2 xref +v t)2;
```

```
In[48]:= val = {v → 1, xref → 10, cref → -1};
```

- Make a movie by plotting the wave function as a function of  $x$  for successive values of  $t$

```
In[49]:= wplot[t_] := Plot[wave[x, t] /. val, {x, -2, 10},
  GridLines → Automatic, Frame → True, PlotRange → {{-2, 10}, {-2, 2}},
  PlotStyle → {RGBColor[1, 0, 0]}, FrameLabel → {"x", "f"}, RotateLabel → False];
```

```
In[50]:= plotarray = Table[wplot[tp], {tp, 0, 20, 1}];
```

