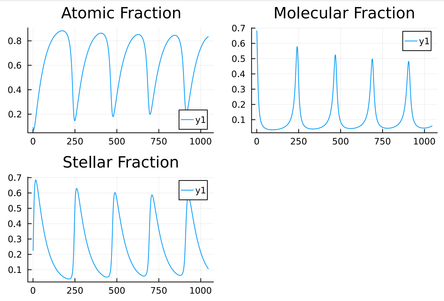
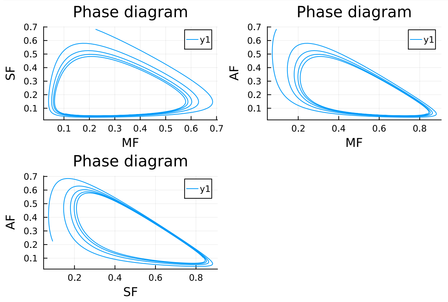
In [7]:
```
using Plots

#Initial values
a=0.1
m=0.7
x=0
dx=0.01

t_val=Float64[]
a_val=Float64[]
m_val=Float64[]
s_val=Float64[]

while x<19
    da = 1 - a - m - 20*(m^2)*a
    dm = 20*(m^2)*a + 25*(m^(1.7))*(a+m-1)
    a = a + da*dx
    m = m + dm*dx
    x = x + dx
    t = 55*x
    s = 1 - a - m
    push!(t_val,t)
    push!(a_val,a)
    push!(m_val,m)
    push!(s_val,s)
end

p1 = plot(t_val,a_val, title = "Atomic Fraction")
p2 = plot(t_val,m_val, title = "Molecular Fraction")
p3 = plot(t_val,s_val, title = "Stellar Fraction")
p4 = plot(s_val,m_val, title = "Phase diagram", xlabel = "MF", ylabel = "SF")
p5 = plot(a_val,m_val, title = "Phase diagram", xlabel = "MF", ylabel = "AF")
p6 = plot(a_val,s_val, title = "Phase diagram", xlabel = "SF", ylabel = "AF")
plot(p1,p2,p3)
```

Out[7]:



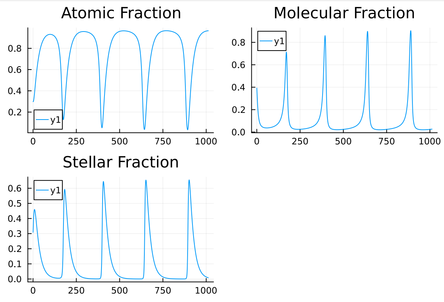
In [8]:
```
plot(p4,p5,p6)
```

Out[8]:



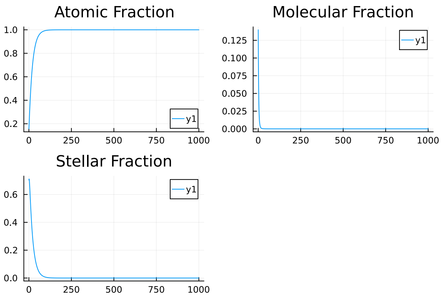
In [3]:
```
using Plots

#Initial values
a=0.3
m=0.4
x=0
dx=0.01

t_val=Float64[]
a_val=Float64[]
m_val=Float64[]
s_val=Float64[]

while x<44
    da = 1 - a - m - 8*(m^2)*a
    dm = 8*(m^2)*a + 15*(m^(1.5))*(a+m-1)
    a = a + da*dx
    m = m + dm*dx
    x = x + dx
    t = 23*x
    s = 1 - a - m
    push!(t_val,t)
    push!(a_val,a)
    push!(m_val,m)
    push!(s_val,s)
end

p1 = plot(t_val,a_val, title = "Atomic Fraction")
p2 = plot(t_val,m_val, title = "Molecular Fraction")
p3 = plot(t_val,s_val, title = "Stellar Fraction")
plot(p1,p2,p3)
```

Out[3]:



In [9]:
```
using Plots

#Initial values
a=0.15
m=0.15
x=0
dx=0.01

t_val=Float64[]
a_val=Float64[]
m_val=Float64[]
s_val=Float64[]

while x<50
    da = 1 - a - m - 10*(m^2)*a
    dm = 10*(m^2)*a + 10*(m^(1.0))*(a+m-1)
    a = a + da*dx
    m = m + dm*dx
    x = x + dx
    t = 20*x
    s = 1 - a - m
    push!(t_val,t)
    push!(a_val,a)
    push!(m_val,m)
    push!(s_val,s)
end

p1 = plot(t_val,a_val, title = "Atomic Fraction")
p2 = plot(t_val,m_val, title = "Molecular Fraction")
p3 = plot(t_val,s_val, title = "Stellar Fraction")
plot(p1,p2,p3)
```

Out[9]:


Atomic Fraction
1.0
0.8
0.6
0.4
0.2
0
250
500
750
1000
y1

Molecular Fraction
0.125
0.100
0.075
0.050
0.025
0.000
0
250
500
750
1000
y1

Stellar Fraction
0.6
0.4
0.2
0.0
0
250
500
750
1000
y1